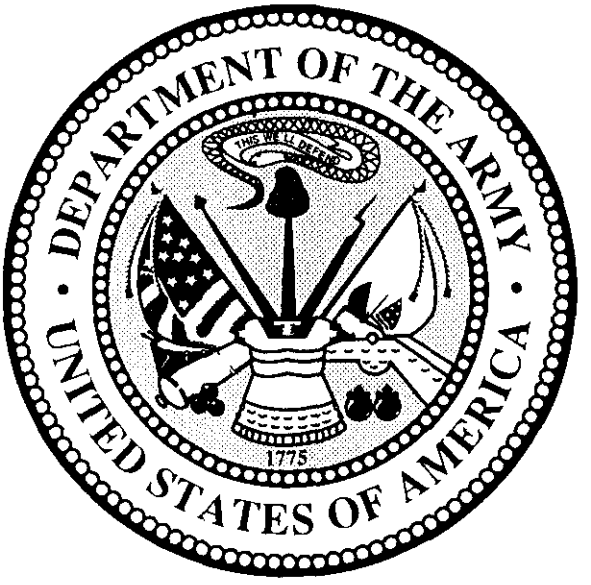
Realignment of Army Research and Technology Functions to Army Research Laboratory Facility at Adelphi, Maryland



September 1992

Environmental Assessment

REALIGNMENT OF ARMY RESEARCH AND TECHNOLOGY FUNCTIONS

TO

ARMY RESEARCH LABORATORY FACILITY AT ADELPHI LABORATORY CENTER ADELPHI, MARYLAND

ENVIRONMENTAL ASSESSMENT

SEPTEMBER 1992

ENVIRONMENTAL ASSESSMENT

REALIGNMENT OF ARMY RESEARCH AND TECHNOLOGY FUNCTIONS TO ARMY RESEARCH LABORATORY FACILITY AT ADELPHI, MARYLAND

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EXECUTIVE SUMMARY

In accordance with the Defense Base Closure and Realignment Act of 1990 (Public Law 101-510) and the recommendations of the Defense Base Closure and Realignment Commission, the Army plans to transfer various research functions to the newly established Army Research Laboratory (ARL) at Adelphi Laboratory Center (ALC), Adelphi, Maryland. The transfer and consolidation of these research functions together with the elimination of positions at ALC will result in a net decrease of approximately 35 ARL positions at ALC.

The transferring research functions to be combined at ALC include the Electronics Technology and Devices Laboratory (ETDL) from Fort Monmouth, New Jersey; a portion of the Atmospheric Sciences Laboratory (ASL) from White Sands Missile Range (WSMR), New Mexico; the research functions (not including the free field Electromagnetic Pulsed Radiation (EMP) testing) from the Harry Diamond Laboratories (HDL) at the Woodbridge Research Facility, Virginia[1/]; and the Directed Energy and Sensors Basic and Applied Research element of the Night Vision and Electro-Optics Directorate (NVEOD) from Fort Belvoir, Virginia, providing the Army a consolidation of interdependent efforts at one installation. Outgoing actions include transferring the armament-related fuze production mission from HDL at ALC to Picatinny Arsenal, New Jersey; the missile-related fuze production mission from HDL at ALC to Redstone Arsenal, Alabama; and a portion of the nuclear survivability and assessment function of HDL at ALC to Aberdeen Proving Ground (APG), Maryland. Receipt of outgoing actions will be evaluated in a separate National Environmental Policy Act (NEPA) analysis.

Preferred Alternative to Proposed Action

The functions and personnel transferring to ALC will require various standard as well as special laboratory facilities, administrative offices, hazardous material and waste storage facilities, a hazardous material emergency response facility, and an industrial wastewater pretreatment facility, in addition to adequate parking and security provisions. Various alternatives to house the transferring personnel and research functions have been evaluated. Currently, suitable space is not available unless on-post renovation and expansion occurs. Off-post constructing or leasing space off post would not be cost-effective, and would not satisfy the objectives of the proposed consolidation. The preferred alternative is to construct new facilities and renovate existing facilities at ALC to accommodate the ARL functions and personnel.

Five site plans involving construction and renovation have been identified and evaluated for the preferred accommodation for the ARL facilities at ALC. These five site plans consist of various new building configurations in the North Parking Lot, South Parking Lot, and 400 Area of ALC, and renovations in the 200 Area as follows:

[1/] Subsequent to the preparation of this environmental assessment, the Army proposed to relocate the Scale Model Facility at Woodbridge to ALC. This action will be evaluated in a separate NEPA analysis.

- Site Plan No. 1 - Construction of all laboratory and support facilities in the North Parking Lot and parking decks in the North and South Parking Lots, and renovations to the 200 Area laboratory facilities. Additional laboratory and office space would be provided through renovation of Buildings 202, 204, and 205.

- Site Plan No. 2 - Construction of laboratory facilities, clean room, and emergency response facility in the North Parking Lot, the wastewater treatment plant in an area southwest of the North Parking Lot, and a parking deck in the South Parking Lot, and renovations to the 200 Area laboratory facility. Additional laboratory and office space would be provided through renovation of Buildings 202, 204, and 205.

- Site Plan No. 3 - Construction of laboratory facilities, emergency response facility, and parking deck on the North Parking Lot, construction of the clean room in the 400 Area, and renovation to the 200 Area laboratory facilities. Additional laboratory and office space would be provided through renovation of Buildings 202, 204, and 205.

- Site Plan No. 4 - Same as Alternative No. 3, except for construction of a parking deck in the South Parking Lot instead of in the North Parking Lot.

- Site Plan No. 5 - Renovation and vertical expansion of 200 Area laboratory facility, construction of the clean room, emergency response facility, and wastewater treatment plant in the North Parking Lot, and a parking deck in the South Parking Lot. Additional laboratory and office space would be provided through renovation of Buildings 202, 204, and 205.

Construction will be phased and will begin in July 1993 with the parking structure completed first. Facility construction will be complete in July 1997. Tenant move-in into existing facilities will take place beginning in 1994, with the most significant move-in taking place in 1997 as the laboratory facilities are completed.

Environmental Issues and Concerns

A Public Notice announcing the intent to prepare an EA for the proposed ARL realignment at ALC was published in The Prince George's County Journal, The Montgomery County Journal, and The Washington Post on 14 February 1992, and mailed to individuals and Federal, State and local agencies on the project mailing list. One set of comments was received addressing (1) increased noise level at ALC; (2) increased employment and parking levels and their associated impacts; (3) effects of any transmitting antennas on the biological

environment (including human health effects); (4) impacts on the adjacent Naval Reserve Training Center (NRTC) and the Naval Surface Warfare Center (NSWC); and (5) the existence of chemical wastes or radioactive materials. The above issues and concerns are addressed in this EA.

Environmental Consequences

The transfer of ARL research functions and personnel to ALC will have very limited effects on Prince George's and Montgomery Counties and the residential communities near ALC. Construction and renovation activities under any of the five site plans will result in minor or insignificant environmental impacts to land use, air quality, soils, recreation and noise. Parking will be temporarily disrupted during construction of the parking structure. The increased concentration of built up areas will diminish the aesthetic character of ALC. Under all site plans there will be renovation/conversion in the 200 Area (Buildings 202, 204, and 205), which will cause some temporary disruption of existing activities at ALC, most notably under Site Plan No. 5. With the implementation of standard environmental protection measures (i.e., erosion and sediment controls and stormwater management), impacts to surface and groundwater resources will also be negligible. The existing Spill Prevention Control, and Countermeasure (SPCC) Plan, Installation Spill Contingency Plan (ISCP), and the Resource Conservation and Recovery Act (RCRA) Consent Agreement, which permits interim operation of a hazardous waste storage facility pending action on a Part B permit application, will all be modified to accommodate the proposed action. The proposed ARL facilities will also include provisions for pretreatment of industrial wastewater prior to discharge to the Washington Suburban Sanitary Commission (WSSC) system. The loss of some on-post parking facilities during project construction will be remedied by providing temporary parking spaces at a nearby location. Site Plan Nos. 3 and 4 could require construction of additional utility lines (i.e., electrical and natural gas).

There will be no impacts to wetlands, or to threatened or endangered species. Impacts to terrestrial ecology, and the potential for impact to presently unknown archeological resources, would be greatest for Site Plan Nos. 3 and 4, where two acres of wooded land would be cleared for the facilities in the 400 Area. Phase I archeological investigations of areas which would be disturbed under the different site plans were completed in June 1992. Potential cultural resources were identified in the 400 Area. Further investigations could be required to determine the significance of these resources if construction were conducted in the 400 Area. Any further investigations will be completed prior to site preparation and clearing, and requirements for compliance with the National Historic Preservation Act (NHPA) will be met.

The storage and handling of hazardous materials and wastes will not pose any significant problems during operation of the proposed facilities since these activities are ongoing at ALC, and the administrative controls and procedures are already in place. There will be an increase in hazardous material storage; however, most of the incoming materials are the same as those currently being maintained by ALC. There will be an increase in hazardous waste generation, but this can be effectively managed by on-site pretreatment or, if

warranted, by increasing the frequency of disposal shipments from the existing on-site RCRA storage facility. There will be no change in ALC's status as a temporary storage facility.

Construction and renovation of the facilities for ARL at ALC will have a positive socioeconomic impact through increased employment and regional income. The increases, however, will not be regionally significant.

Mitigation

During construction, standard construction practices under any of the site plans will include erosion and sediment control plans, modifications to the ALC SPCC Plan and ISCP, and construction noise and dust controls. Construction will be phased to minimize the on-site parking problem during construction. Temporary parking will be provided as necessary. If unknown archeological resources are encountered, mitigation will be implemented to comply with Sections 106 and 110 of the NHPA.

Recommendation

Comparison of the environmental impacts associated with the five site plans indicates that Site Plan Nos. 3 and 4 would have greater impacts than Site Plan Nos. 1, 2, or 5 because of the clearing of two acres of wooded land and possible additional infrastructure requirements. Further, these site plans would be operationally less efficient because they are located further away from the main laboratory and administrative buildings. For these reasons, Site Plan Nos. 3 and 4 have been eliminated from further consideration. The difference among Site Plan Nos. 1, 2, and 5 with regard to potential environmental impacts is minor. Site Plan No. 5 would have the least visual impact but the greatest disruption to existing operations during construction. Each of these three site plans was found to have no cumulative or individual significant impact. Consequently, a Finding of No Significant Impact (FNSI) is recommended.

Relationship of the Proposed Action to Environmental Requirements

Compliance with the following relevant Federal environmental statutes, Executive Orders, regulations, and guidelines is ongoing and consistent with the status of the base realignment and closure (BRAC) action relating to the realignment of ARL at ALC at the time of this EA. Ongoing compliance means that some installation actions pertaining to these requirements remain to be met before the realignment action is fully implemented.

- National Environmental Policy Act (NEPA).
- Provisions of Public Law 101-510, the National Defense Authorization Act, which relate to NEPA.
- Regulations of the President's Council on Environmental Quality (CEQ). These regulations contain the procedural requirements for implementation of NEPA.
- Endangered Species Act.

- Archeological Resources Protection Act of 1979.
- National Historic Preservation Act (NHPA), and related acts such as the Historic Sites, Buildings, and Antiquities Act, and the Archeological and Historic Preservation Act.
- Federal Water Pollution Control Act, as amended by the Clean Water Act.
- Resource Conservation and Recovery Act (RCRA) of 1976.
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA).
- Toxic Substance Control Act (TSCA).
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).
- Executive Order 12372 "Intergovernmental Review of Federal Programs."
- Fish and Wildlife Coordination Act.
- Executive Order 11990 "Protection of Wetlands."
- Executive Order 11988 "Floodplain Management."
- Executive Order 12088 "Federal Compliance with Pollution Control Standards."
- Hazardous Materials Transportation Safety Act of 1975.
- Noise Control Act of 1972, as amended.
- The Clean Air Act, as amended.
- The Solid Waste Disposal Act.
- Interstate Chesapeake Bay Agreements.
- Army Regulation 200-1 Environmental Protection and Enhancement.
- Army Regulation 200-2 Environmental Effects of Army Actions.
- Army Regulation 420-40 Historic Preservation.
- Master Plan, Installation Design Guide

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1.0 PURPOSE, NEED AND SCOPE

1.1 PURPOSE AND NEED

As the Army reduces its force structure in response to changing global security requirements, fewer Army installations are needed to station the smaller force. By 1995, the Army will be reduced to 535,000 active forces and 567,000 reserve components (Reserve and National Guard). In addition to reducing its total size, the Army will realign activities to other locations to accomplish the Army's mission more economically. This smaller and realigned force will be stationed and consolidated at the most efficient installations.

The process used to determine installations for closure or realignment was established in the Defense Base Closure and Realignment Act of 1990 (1990 Base Closure Act or BRAC 91), Public Law 101-510. The military services used criteria established by the Secretary of Defense and approved by Congress, and a force structure plan provided by the Chairman of the Joint Chiefs of Staff to recommend installations for closure or realignment. A consolidated Department of Defense (DoD) list was submitted by the Secretary of Defense to a bipartisan commission appointed by the President and confirmed by the Senate. The Defense Base Closure and Realignment Commission evaluated the Secretary's recommendations and sent its findings to the President. The President approved the recommendations and forwarded them to Congress on 11 July, 1991. Because Congress did not disapprove these recommendations, they must be implemented as specified by the 1990 Base Closure Act.

Included in the recommendations as part of the realignment of army laboratories, the Commission recommended establishment of an Army Research Laboratory (ARL) at two primary sites: Adelphi Laboratory Center (ALC), Adelphi, Maryland, and Aberdeen Proving Ground (APG), Maryland. Establishment of the ARL at APG is evaluated in a separate National Environmental Policy Act (NEPA) document. This environmental assessment (EA) evaluates establishment of an ARL at ALC by realigning:

- The Electronics Technology and Devices Laboratory (ETDL) from Fort Monmouth, New Jersey to ARL at Adelphi, Maryland;
- A portion of the Atmospheric Sciences Laboratory (ASL) from White Sands Missile Range (WSMR), New Mexico to ARL at Adelphi, Maryland;
- The Harry Diamond Laboratories (HDL) research functions from the Woodbridge Research Facility, Woodbridge, Virginia to ARL at Adelphi, Maryland, and closure/disposal of the Woodbridge Research Facility[1/];

[1/] The HDL is a laboratory which supports the ALC mission at ALC, Adelphi, Maryland; Blossom Point, Maryland; and Woodbridge, Virginia. Closure of the Woodbridge Research Facility is not considered in this EA. Subsequent to the preparation of this environmental assessment, the Army proposed to relocate the Scale Model Facility at Woodbridge to ALC. This action will be evaluated in a separate NEPA analysis.

- The Directed Energy and Sensors Basic and Applied Research element of the Night Vision and Electro-Optics Directorate (NVEOD) from Fort Belvoir, Virginia to ARL at Adelphi, Maryland;

- The armament-related fuze production mission from HDL at Adelphi, Maryland to Picatinny Arsenal, New Jersey;

- The missile-related fuze production mission from HDL at Adelphi, Maryland to Redstone Arsenal, Alabama.

As part of the assessment of cumulative impacts, this EA includes an evaluation of the following non-BRAC realignment to consolidate laboratory work at the newly-established ARL:

- Transfer a portion of the nuclear survivability and assessment function of the HDL from Adelphi, Maryland to ARL at APG, Maryland.

1.2 SCOPE

The Act specifies that NEPA does not apply to actions of the President, the Commission, or the DoD, except

> "(i) during the process of property disposal, and (ii) during the process of relocating functions from a military installation being closed or realigned to another military installation after the receiving installation has been selected but before the functions are relocated."

The Act further specifies that

> "in applying the provisions of NEPA to the process, the Secretary of Defense and the Secretaries of the military departments concerned shall not have to consider: (i) the need for closing or realigning the military installation which has been recommended for closure or realignment by the Commission; (ii) the need for transferring functions to any military installation which has been selected as the receiving installation; or (iii) military installations alternative to those recommended or selected."

NEPA does not apply to the 1991 base realignment and closure (BRAC 91) deliberation and decision process. However, it does apply to the methods of implementing actions at receiving installations. It also applies to the realignment of other missions and operations not included in the base closure actions. The environmental and socioeconomic effects of realignment and associated activities such as construction must be analyzed as appropriate receiving actions of the installations and must be documented to fulfill the requirements of NEPA. The scope of this EA analyzes the effects of receiving the realigned activities at Adelphi, Maryland. The environmental study area for this EA is the metropolitan

Washington, D.C. area, including Prince George's and Montgomery Counties, Maryland. The areas identified for the socioeconomic analyses are Prince George's and Montgomery Counties.

1.3 PUBLIC INVOLVEMENT

A Public Notice announcing the intent to prepare an EA for the proposed ARL realignment at ALC was published in The Prince George's County Journal, The Montgomery County Journal, and The Washington Post on 14 February 1992, and mailed to individuals and Federal, State and local agencies on the project mailing list. One set of comments was received addressing (1) increased noise level at ALC; (2) increased employment and parking levels and their associated impacts; (3) effects of any transmitting antennas on the biological environment (including human health effects); (4) impacts on the adjacent Naval Reserve Training Center (NRTC) and the Naval Surface Warfare Center (NSWC); and (5) the existence of chemical wastes or radioactive materials.

The public and concerned organizations will be notified of the findings and conclusions of this EA by publishing the Finding of No Significant Impact (FNSI) or a Notice of Intent to Prepare an Environmental Impact Statement (EIS), and making the EA available for review 30 days prior to initiating the actions. The ALC Public Affairs Officer is available to provide information to the public regarding the status or progress of the activities associated with the realignment. The process to complete the realignment is shown on Figure 1-1.

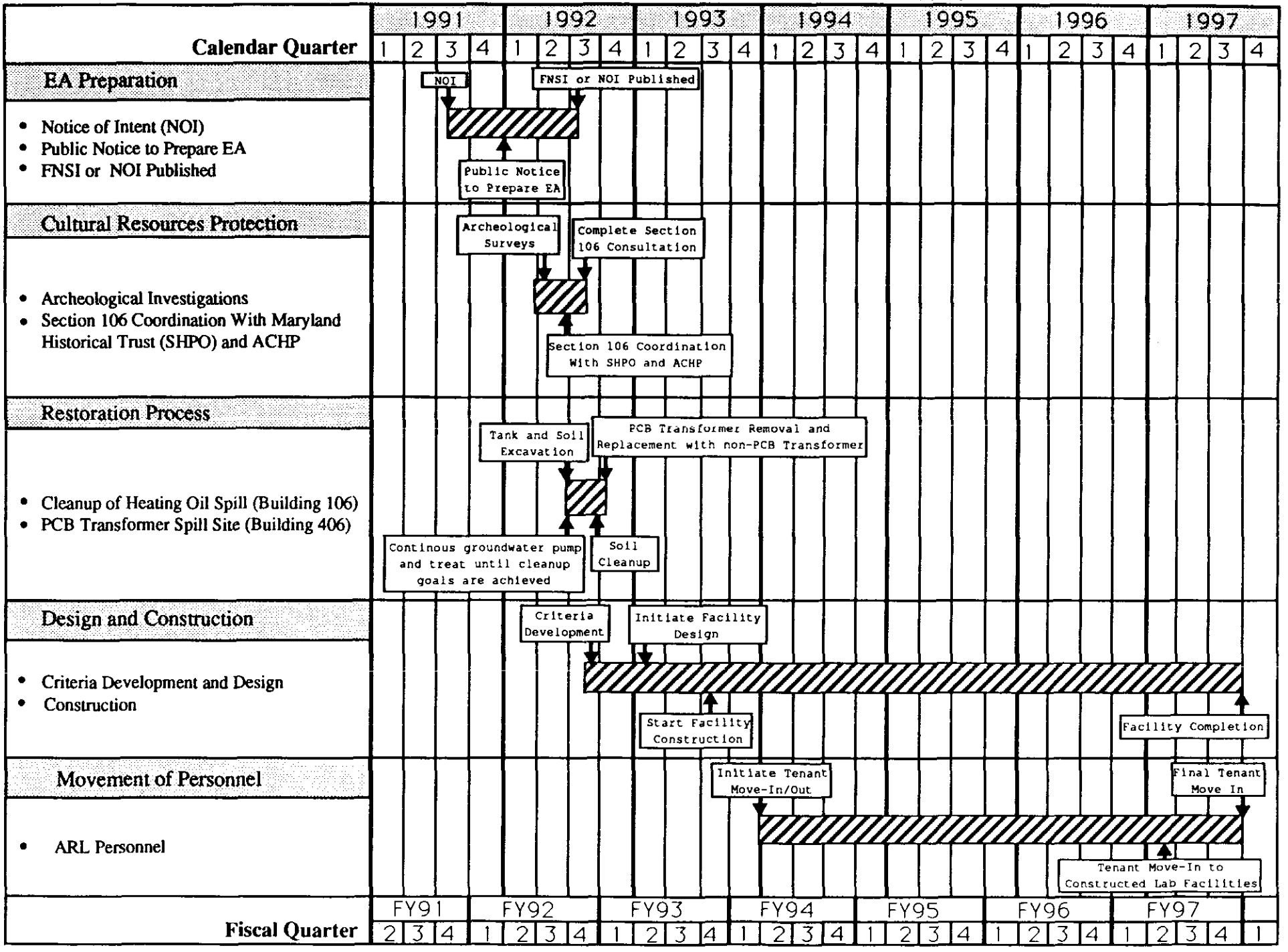
1.4 IMPACT ANALYSIS

This EA identifies, documents, and evaluates the relevant incremental and cumulative effects on existing resources of receiving and stationing missions at ALC. These missions are described in Section 2.0, Description of the Proposed Action. The baseline established to analyze the environmental and socioeconomic effects of these actions, and the reference to this baseline as the no-action alternative is described in Section 3.3.

An interdisciplinary team of engineers, biologists, economists, archeologists, historians, military technicians, and other experts analyzed the proposed action against the existing baseline conditions described in Section 4.0, Affected Environment, and identified the relevant beneficial and adverse impacts. Section 5.0, Environmental Consequences of the Proposed Action and Alternatives, presents these impacts and the planned mitigation.

The Army standardized the evaluation of socioeconomic effects caused by base closure and realignment actions by using the Economic Impact Forecast System (EIFS) model developed by the U.S. Army Construction Engineering Research Laboratory (CERL), and described in Appendix D. The Army will meet the requirements of the provisions of Sections 106 and 110(f) of the National Historic Preservation Act (NHPA), as described in Section 4.10, Cultural Resources, prior to the commencement of construction for the realignment of ARL facilities.

Figure 1-1
PROCESSES ASSOCIATED WITH REALIGNMENT OF ARL AT ALC



2.0 DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the realignment of ARL facilities involved in signatures, sensors, signal and information processing; advanced electronics technology and power sources; and battlefield environments to ALC. The realignment at ALC will involve research missions transferring to ALC from Army installations in New Jersey, New Mexico, and Virginia, and certain ALC functions transferring from ALC to Army installations in Maryland, New Jersey, and Alabama. The research missions transferring to ALC will be located close to existing ALC facilities. Section 2.1 describes the activities to be realigned at ALC, and the resulting overall change in civilian and military employment at the site. The new laboratory and support facilities that will be required because of the realignment are described in Section 2.2. Section 2.3 describes the proposed operation.

2.1 PROPOSED ACTION

The Commission on Base Closure and Realignment recommended realignment actions for the ARL at ALC, Adelphi, Maryland. The following is a description of the proposed realignment actions:

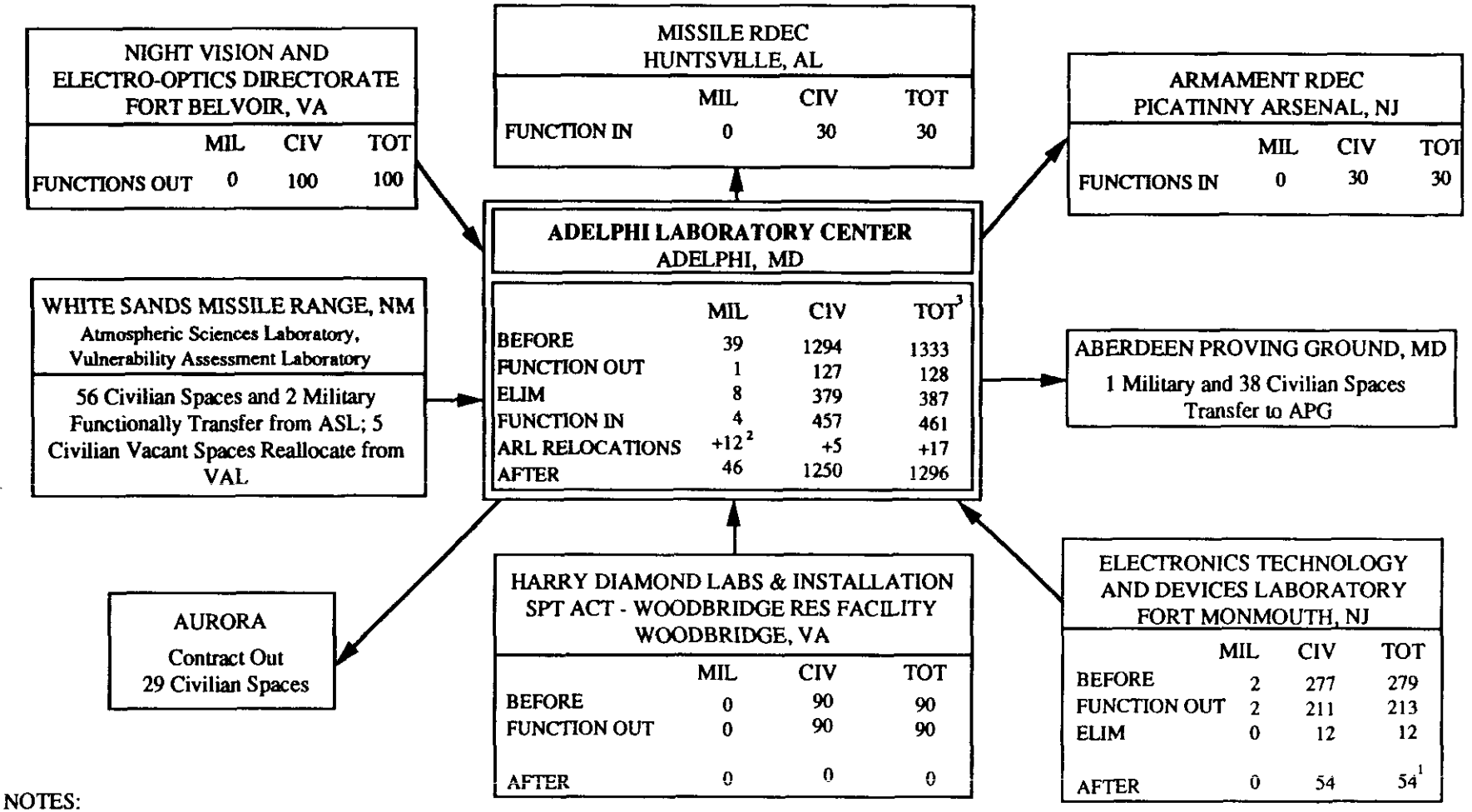
(1) Move the ETDL from Fort Monmouth, New Jersey to ALC. The ETDL's existing functions include emerging electronic device technology, electronic materials, solid state electronics, frequency control and timing, integrated device technology, circuits and subsystems development, display devices and technology, microwave/lightwave components, analog signal processing, microwave/millimeter-wave tubes, pulse power technology, and power sources.

(2) Move the Atmospheric Mitigation and Exploitation Division and the Battlefield Atmospheric Simulation Division of the ASL from WSMR, New Mexico to ALC. These Divisions will perform the following missions: mitigation of the deleterious effects of adverse weather and battle-induced atmospheres on combat systems and operations; and development of atmospheric numerical models for the battle area.

(3) Move the HDL research mission from the Woodbridge Research Facility, Woodbridge, Virginia to ALC. The functions transferring to ALC are the continued development of survivability technology. The realignment does not include free field Electromagnetic Pulsed Radiation (EMP) testing.

(4) Move the Directed Energy and Sensors Basic and Applied Research element of the NVEOD from Fort Belvoir, Virginia to ALC. The NVEOD transfer will support optical and infrared, optoelectronic and microwave/photonic materials and devices research and development.

The reallocation of functions from ETDL, ASL, HDL, and NVEOD will move approximately 461 positions, primarily civilian, to ALC (Figure 2-1). Approximately 128 positions will transfer from ALC to other facilities (i.e., Huntsville, Alabama; Picatinny Arsenal, New



NOTES:

All figures are approximations and are only used for planning purposes.

1. 54 spaces to be transferred to CECOM, Ft. Monmouth, NJ.
2. Includes +6 officers from AMC approved by zero-based review.
3. Migrations include approved non-BRAC actions.

Figure 2-1
ARL REALIGNMENT AT
ADELPHI LABORATORY CENTER

Jersey; and APG, Maryland) or be contracted out. Consolidation and realignment at ALC will eliminate approximately 387 additional positions, primarily civilian. An estimated 17 positions will be reallocated to the ARL. The overall effect of these activities will result in a net loss of approximately 35 ARL positions at ALC.[1/]

2.2 PREFERRED ALTERNATIVE TO IMPLEMENT PROPOSED ACTION

2.2.1 Preferred Accommodation

The ARL activities at ALC will require the construction of new structures and renovation of existing facilities to house the proposed research and high technology functions transferring in and the associated support requirements. Construction will also include the renovation of the Sensitive Compartmented Information Facility (SCIF) and other laboratory renovation and conversion for a total of 118,292 square feet (SF) of renovation and conversion. Six separate facilities, a 3,000 SF security crosswalk, and a 5,400 SF special use area are planned to be constructed at ALC to accommodate realigned activities. The facilities include:

- Special Research and Technology (R&T) Laboratory (75,000 SF)
- Clean Room (95,000 SF)
- Parking Structure (224,000 SF)
- Industrial Wastewater Collection and Pretreatment Facilities (30,000 SF)
- Heating/Cooling (H/C) Plant Addition (4,000 SF)
- Hazardous Material Emergency Response Facility (5,800 SF)

The planned facilities are state-of-the-art R&T facilities, including laboratory areas for signatures, sensors, signal and information processing; electronics technology and power sources; and battlefield environments. The clean room will be a pressurized environmentally controlled laboratory that will provide a "clean area" for specialized electronics research. Other features planned include: access for the handicapped; expansion of the H/C plant to provide an additional 1,000 tons of air conditioning; special power supplies; compressed air; industrial and laboratory gas systems; special ventilation and exhaust filtration; an intrusion detection system; energy monitoring and control system; stormwater drainage; and sidewalks, curbs, and roadways.

The hazardous material emergency response facility and the wastewater pretreatment facility will be constructed in support of the new laboratory facilities. The hazardous material emergency response facility will store fire equipment and vehicles necessary for fighting hazardous materials fires and is required to support the activities in the clean room. The wastewater pretreatment facility will process all waste streams from operations of the new laboratory facilities in compliance with applicable environmental laws and regulations.

[1/] All figures are approximations and subject to change. Therefore, this EA assumes that there will be a net loss of 35 ARL positions at ALC.

Most of the new structures are planned to be constructed in the North Parking Lot. In order to provide enough parking for the facility, a multi-level parking garage with enough spaces to accommodate approximately 560 vehicles will be constructed on either the North or South Parking Lots. The new construction will require demolition of approximately 5.5 acres of paved parking area.

2.2.2 Preferred Schedule

Because of space restrictions at ALC, construction of the planned facilities will be phased over a four-year period to accommodate construction access and to minimize disruption to normal ALC activities. The parking garage and the H/C plant expansion will likely be constructed first; the southern half of the South Parking Lot may be used as a laydown area for construction equipment and trailers. The industrial wastewater treatment plant, the hazardous material emergency response facility, the R&T research laboratory structures, the clean room, the two enclosed security crosswalks, and renovation and conversion in the existing laboratory and general purpose laboratory buildings will likely be constructed in subsequent phases.

The proposed construction schedule is shown in Figure 1-1. Construction of the parking garage is scheduled to begin in July 1993 with completion of the total project projected for July 1997. Start-up of laboratory operations is scheduled for September 1997. As Laboratory Command (LABCOM) functions are divested and people at ALC are transferred out, space will be available to move in the personnel who will perform ARL functions. Tenant move-in will likely commence in 1994 with the move-in for the newly constructed laboratories taking place from February 1997 to September 1997.

2.2.3 Preferred Site Plan

Five site plans were developed for the proposed facilities. The environmental impacts associated with the five site plans would be minor and similar for all five site plans. The preferred site plan will therefore be selected based on the results of engineering evaluations. The engineering evaluations will take place in September 1992 through December 1992.

2.3 PROPOSED OPERATION

Operations of the realigned groups at ARL at ALC will be similar to existing operations. ETDL, HDL, ASL, and NVEOD will continue to execute their missions under the auspices of ARL. While business plans may change in response to changing needs, the current business areas are projected to be valid and typical of the work to be conducted at ALC.

The realignment of ETDL constitutes the greatest single element of change at ALC. The current ETDL, to be newly designated as the Electronics and Power Sources Directorate (EPSD) of the ARL, is a fully staffed, multidisciplinary function charged with the Army's primary mission in research and development in advanced electronics and power sources.

Collocated with the EPSD are the Sensors, Signatures, Signal, and Information Processing Directorate and the Battlefield Environment Directorate.

Current business areas of the composite Directorate mentioned above include: electronic devices, microwave/lightwave components, microcircuit design and component assembly, sensors development and integration, signal and information processing, battlefield atmospheric simulation and assessment, atmospheric mitigation and exploitation, and battle weather data.

At ALC, the sensors, signatures, and signal and information processing group will explore multi-sensor approaches to enhance the Army's capability to detect, identify, locate, and target the enemy. The group will combine expertise in directed energy and passive sensor technologies from the NVEOD with expertise in active sensing and signatures from HDL; it will be collocated with battlefield environment from the ASL and advanced electronics and power sources from the ETDL to ensure consideration of the war fighting environment and state-of-the-art electronics through the development of advanced sensor and signal processing systems. By combining these efforts, it is expected that the total mission of research in the battlefield environment, along with research into electronics, will be enhanced.

3.0 ALTERNATIVES

In accordance with NEPA and the 1990 Base Closure Act, a number of alternative means to implement the ARL realignment at ALC were evaluated. These alternatives include:

- Use of existing on-post and off-post facilities;
- Alternative sites at ALC for construction of new facilities; and
- No action

This section describes the alternatives and five site plans that were prepared to accommodate renovation of existing facilities and new construction at ALC. The environmental impacts associated with development of these site plans are presented in Section 5.

3.1 ALTERNATIVES TO CONSTRUCTION AT ALC

The alternatives to the construction of new facilities at ALC to house the realignment activities include: (1) renting/leasing of space off post to accommodate the realignment activities; (2) use of existing facilities at ALC; (3) renovation of existing facilities at ALC to absorb the realignment activities; and (4) construction of facilities at the Naval Surface Warfare Center (NSWC).

Renting or leasing space off post is not a feasible option since renting or leasing would not meet the requirements of the Defense Base Closure and Realignment Act of 1990 to locate the ARL facilities at ALC. Off-post accommodations also would not achieve one of the realignment objectives of enhancing the operational efficiency of research in sensors, signatures, signal and information processing, battlefield environment, and electronics by combining these efforts in one centralized location. Further, because transferring functions will have no need for interim facilities, temporary renting or leasing of space off post was considered unnecessary. Therefore, this alternative is not discussed in this EA.

The Army evaluated the existing facilities at ALC and found that none of the existing facilities is adequate to house the laboratory facilities or to provide the necessary functions to support laboratory operations. Renovation and conversion of existing facilities vacated by functions transferring out of ALC and through consolidation of ALC activities was determined to be the best use of available floor space and to have fewer environmental impacts than new construction. Therefore, renovation and conversion is planned for Buildings 202, 204, and 205. However, because renovation and conversion cannot accommodate all laboratory requirements, particularly the clean room and special R&T laboratories, the Army determined that a combination of renovation and new construction is the only feasible alternative for the ARL realignment at ALC.

Construction of ARL facilities on land owned by the Naval Surface Warfare Center adjacent to ALC was considered and rejected. The steep terrain and associated stream, the present and past uses of the land, and the distance from existing ALC buildings make this area environmentally and operationally unacceptable.

3.2 ALTERNATIVE CONSTRUCTION SITES

New construction sites at ALC are limited by the lack of adequate space for expansion. The steep terrain, the existence of Paint Branch Creek plus the unnamed tributary to the north of the North Parking Lot, and a 150-foot buffer zone along Paint Branch Creek and along the ALC property boundary constrain development (Figure 3-1). Because most of the developable land is occupied by existing buildings, no undeveloped sites are available to accommodate all the new construction required.

A wooded area to the east of the main entrance was considered and rejected as an alternative site. The developable portion of the site is small (i.e., approximately 2 acres) after allowances are made for the required buffer on the south and east of the site and the steep terrain to the north. More importantly, this wooded area shields ALC from the residential area to the east.

Alternative site plans were prepared which would make use of the small areas of undeveloped land and land currently used for vehicle parking. All alternative site plans include construction on at least a portion of the North Parking Lot since that is the only site at ALC sufficiently large enough to accommodate laboratory facilities. The North Parking Lot offers the opportunity to enhance operational efficiency through its proximity to existing facilities.

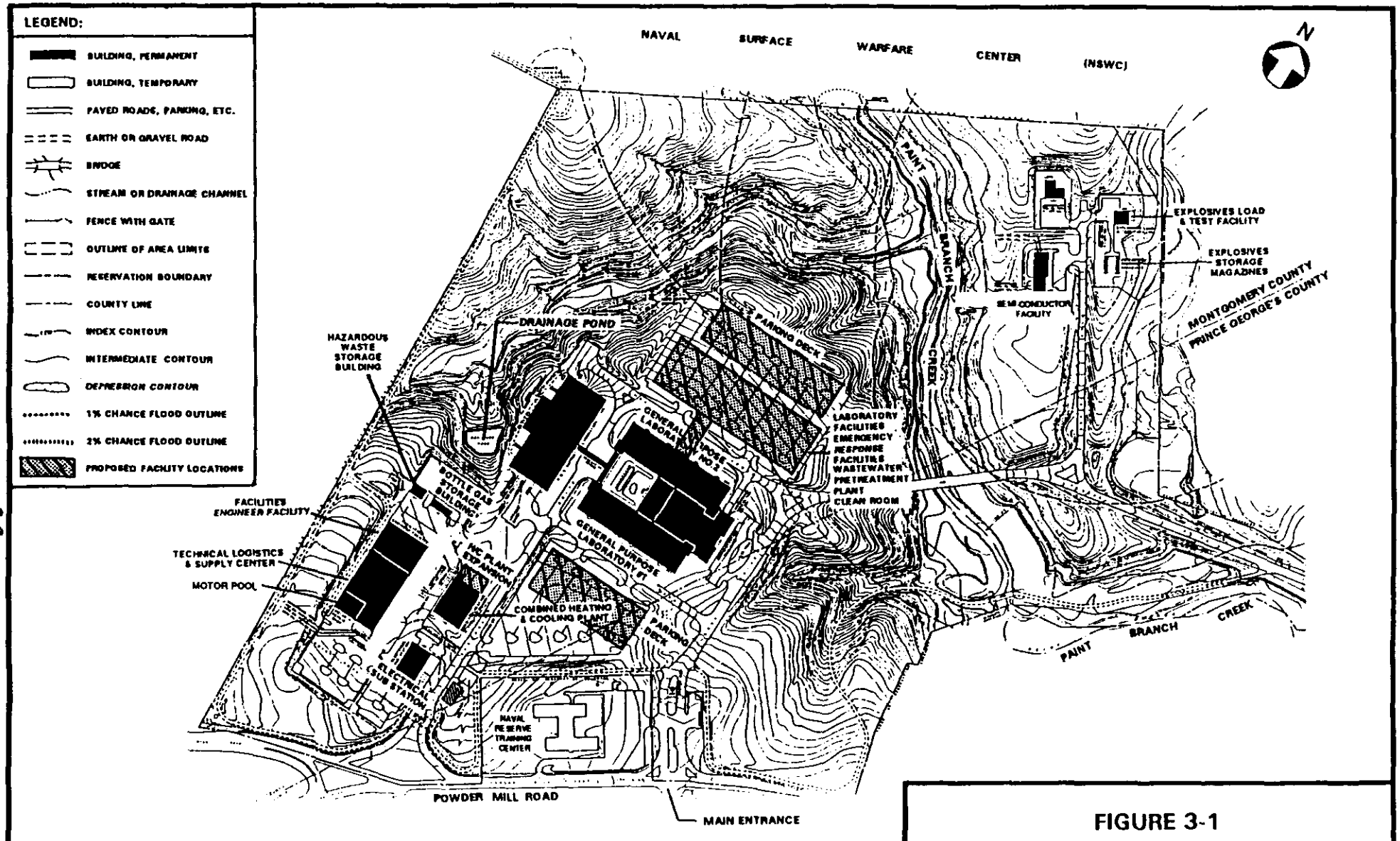
Five site plans were identified for the new laboratory and ancillary facilities. The site plans include areas in the North and South Parking Lots, renovation to the general purpose laboratory buildings in the 200 Area, and a wooded section in the 400 Area (Figures 3-1 through 3-5). None of the five site plans would affect the easternmost portion of the installation which includes Buildings 500 through 505. The site plans presented here are conceptual and may be modified during detail design. They are, however, typical of what would be constructed and provide the basis for the environmental impact assessment presented in Section 5.0. A description of each site plan follows.

3.2.1 Site Plan No. 1 - North Parking Lot, Single Laboratory Building

In this site plan, ninety percent of the area of the existing North Parking Lot would be needed to provide for the clean room and special R&T laboratories, the industrial wastewater pretreatment facility and the emergency response facility (Figure 3-1).

The North Parking Lot is a 4.7-acre paved area just to the north of the existing laboratory buildings. The east, north, and west sides of the North Parking Lot are bordered by steep wooded slopes that drain toward a tributary of Paint Branch Creek on the west and north, and toward Paint Branch Creek on the east. The South Parking Lot is to the south of the existing laboratory buildings and is primarily surrounded by other ALC support buildings and the Naval Reserve Training Center (NRTC).

Parking displaced from the North Parking Lot would be accommodated by constructing multi-level parking structures in both the North and South Parking Lots. The R&T laboratory facilities would be connected to Building 204 (existing laboratories) by an enclosed security crosswalk.



NOTES:

1. THIS GRID IS THE COMMON GRID FOR BOTH THE WASHINGTON SUBURBAN SANITARY COMMISSION (WSSC) AND THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION (M-NCPPC).
2. NO HISTORIC PLACES ARE NOTED ON *THIS MAP*.
3. CONTOURS ARE BASED ON SURVEYS PERFORMED BY MARYLAND SURVEYING AND ENGINEERING CO., INC. IN 1968 AND 1971. THEY ARE CORRECTED FOR "AS BUILT" GRADING.

300 0 300 600

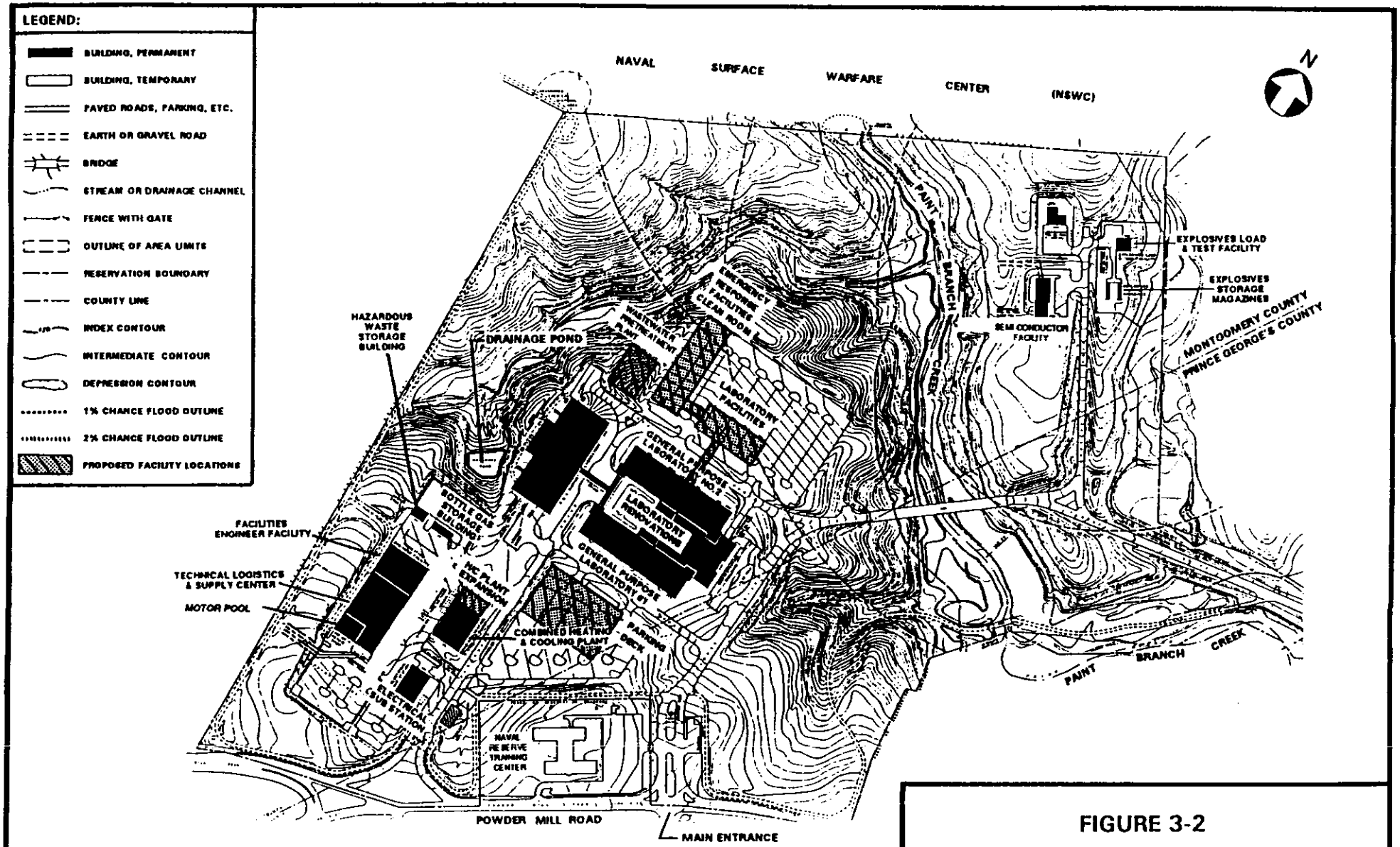
APPROXIMATE SCALE IN FEET

FIGURE 3-1

- SITE PLAN NO. 1 -
NORTH PARKING LOT
SINGLE LABORATORY BUILDING
ADELPHI LABORATORY CENTER

SCALE: AS SHOWN

Prepared by Ebasco Services Incorporated for the U.S. Army Laboratory Command



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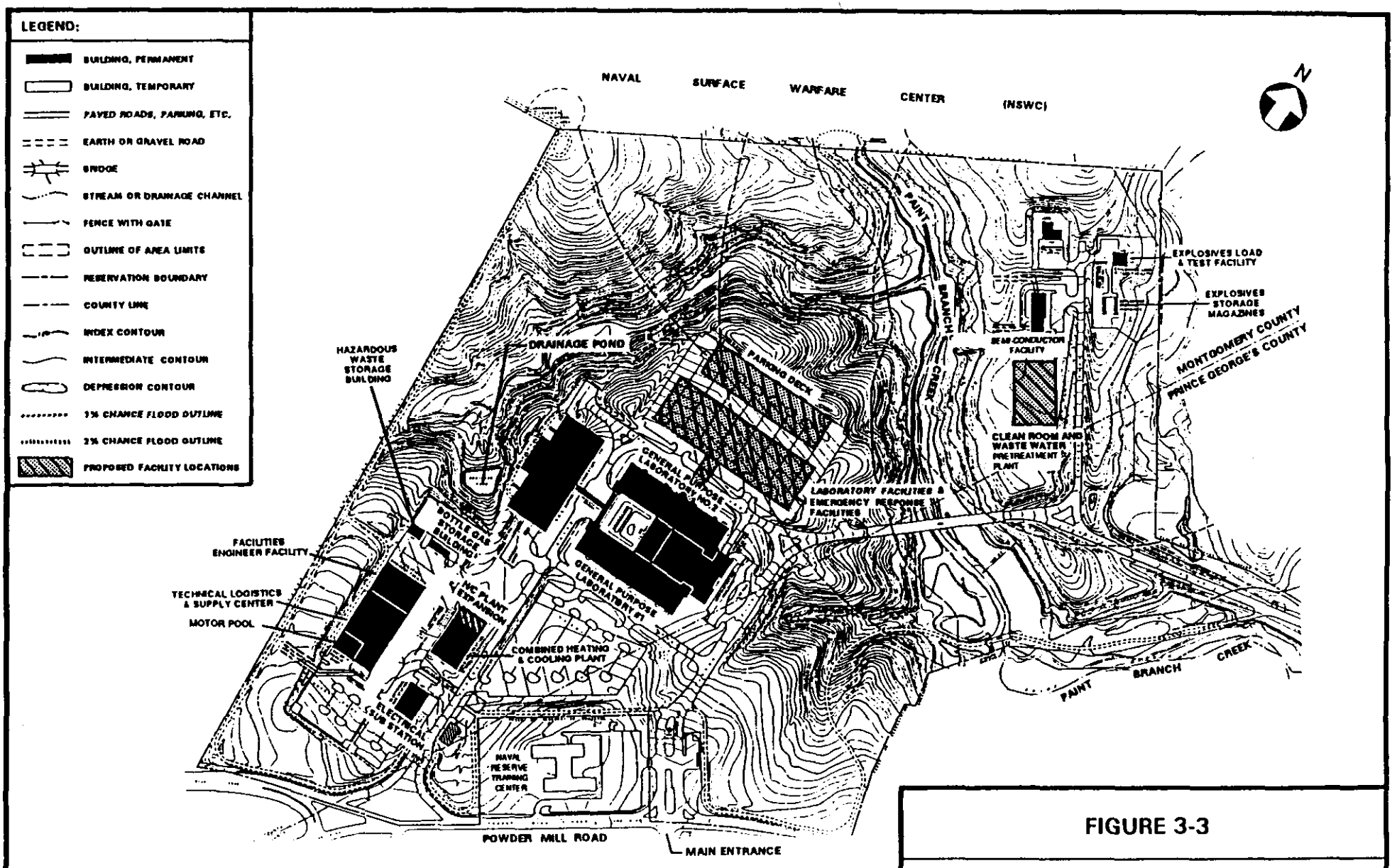
APPROXIMATE SCALE IN FEET

FIGURE 3-2

- SITE PLAN NO. 2 -
NORTH PARKING LOT
MULTIPLE LABORATORY FACILITIES
ADELPHI LABORATORY CENTER

SCALE: AS SHOWN

Prepared by Ebasco Services Incorporated for the U.S. Army Laboratory Command



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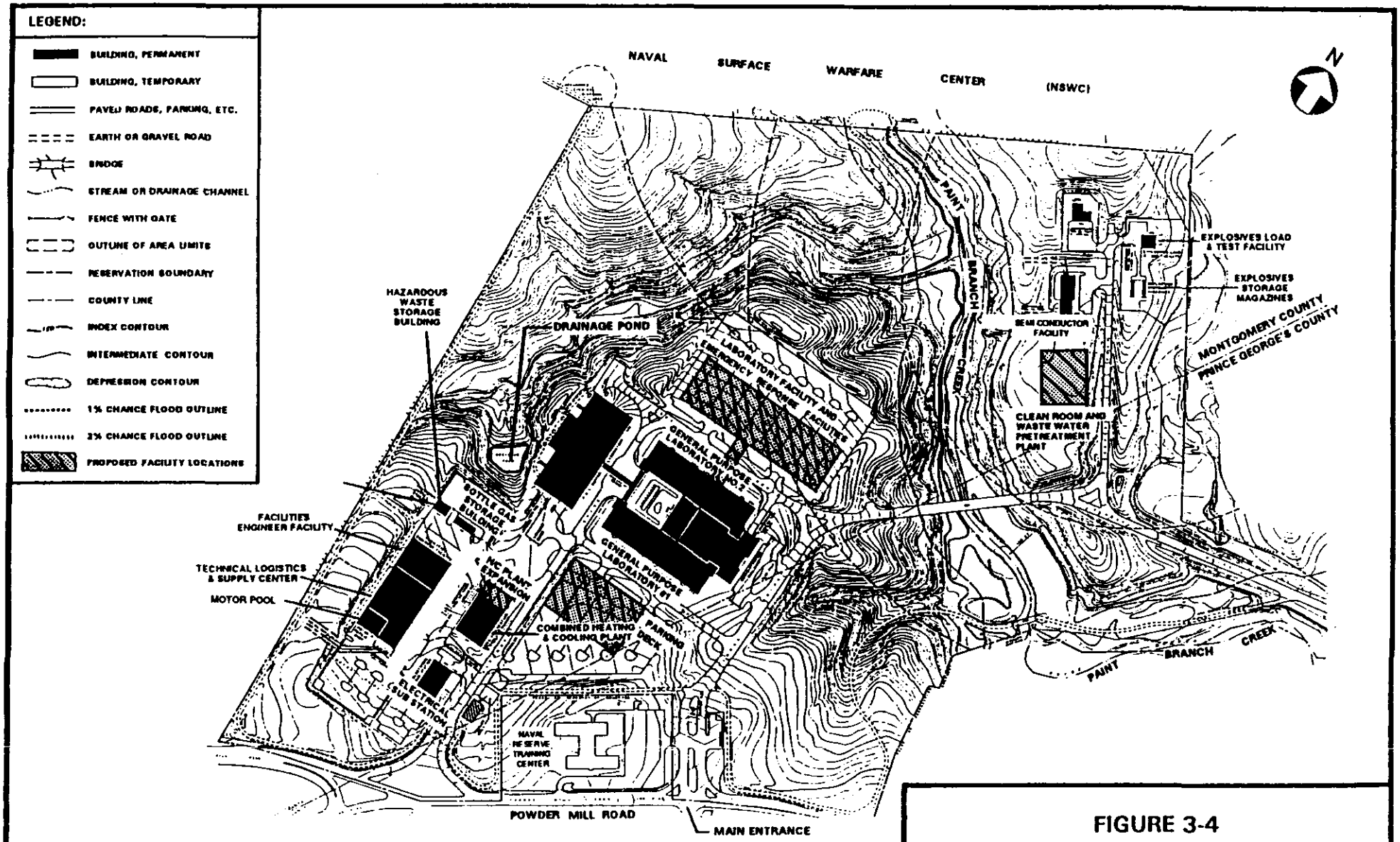
APPROXIMATE SCALE IN FEET

FIGURE 3-3

- SITE PLAN NO. 3 -
400 AREA WITH
NORTH PARKING DECK
ADELPHI LABORATORY CENTER

SCALE: AS SHOWN

Prepared by Ebasco Services Incorporated for the U.S. Army Laboratory Command



NOTES:

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APPROXIMATE SCALE IN FEET

FIGURE 3-4

- SITE PLAN NO. 4 -
400 AREA WITH SOUTH PARKING DECK
ADELPHI LABORATORY CENTER

SCALE: AS SHOWN

Prepared by Ebasco Services Incorporated for the U.S. Army Laboratory Command

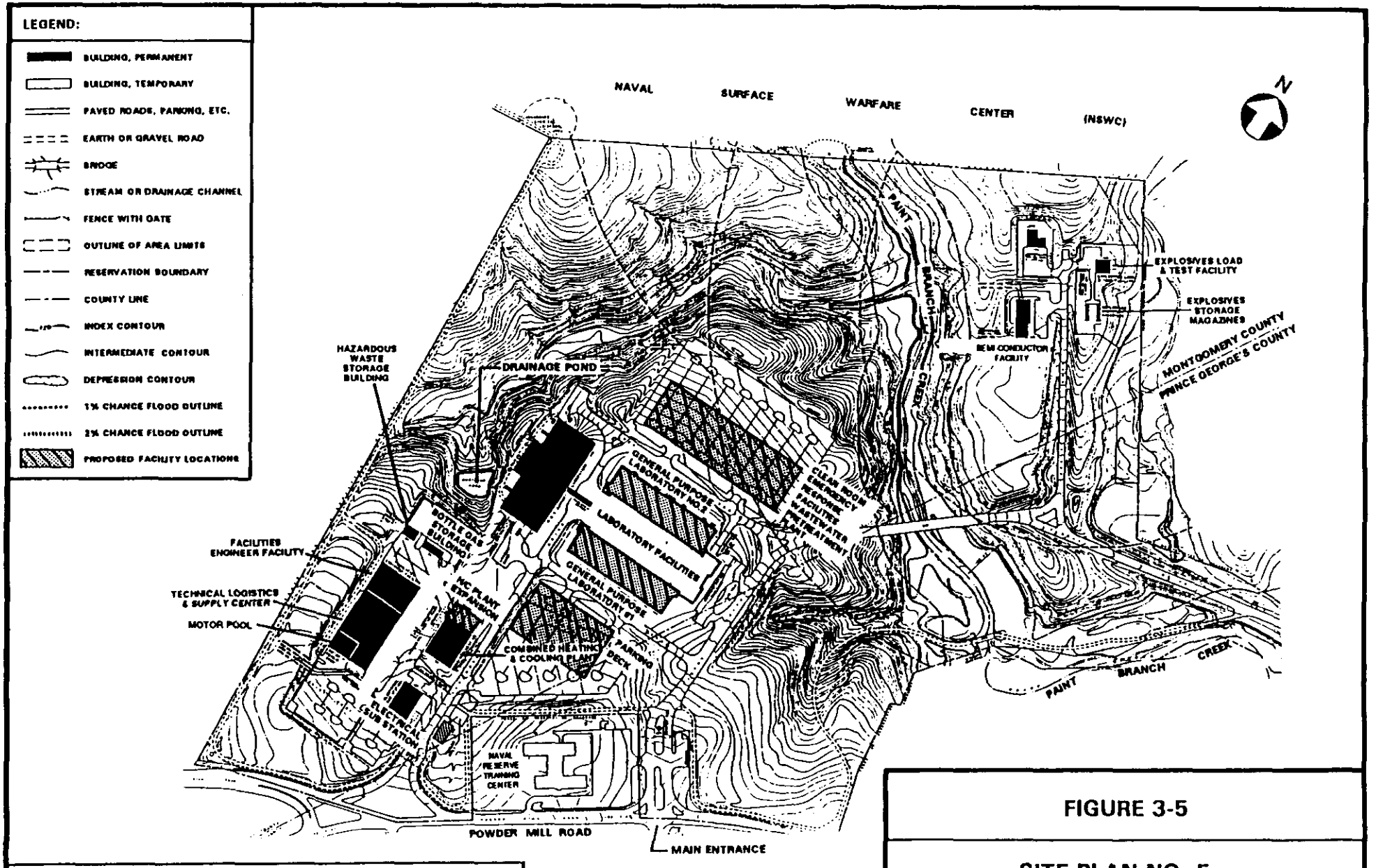

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FIGURE 3-5

- SITE PLAN NO. 5 -
200 AREA
LABORATORY RENOVATION
ADELPHI LABORATORY CENTER

SCALE: AS SHOWN

Prepared by Ebasco Services Incorporated for the U.S. Army Laboratory Command

The industrial wastewater pretreatment facility and the emergency response facility would be located within the newly constructed laboratory building. An extension of the H/C plant (Building 106) would be required.

3.2.2 Site Plan No. 2 - North Parking Lot, Multiple Buildings

In this site plan, the additional ARL facilities would be placed on the existing North Parking Lot (Figure 3-2). The clean room would be located on the western part of the North Parking Lot, and the R&T laboratory facilities would be constructed on the southern part of the North Parking Lot. All parking for ALC would be in the South Parking Lot, which would require the construction of a multi-story parking structure.

The industrial wastewater pretreatment facility would be located west of the new clean room in an area west of the North Parking Lot. Construction of this building may require extensive earthwork and slope stability measures because of the existing grade in the area (i.e., 15 to 20 percent). The emergency response facility would be located within the new laboratory building and the H/C plant expansion would be added to Building 106.

3.2.3 Site Plan No. 3 - 400 Area with North Parking Deck

A section of the 400 Area has been identified to accommodate future development. This area is a small wooded plateau approximately 1.8 acres in size, located northeast of the existing 200 Area laboratory facilities. The remaining areas adjacent to this part of the 400 Area are steeply wooded slopes that drain to Paint Branch Creek to the west and south of the site, and a paved road and upland forests to the east and north of the site.

Because of the steep slopes, this small site cannot accommodate all of the proposed ARL facilities. Therefore, only the clean room and industrial wastewater pretreatment facilities would be located in the 400 Area (Figure 3-3). The R&T laboratory facilities, including the emergency response facility, would be placed on the North Parking Lot, and connected to Building 204 via an enclosed security crosswalk. Since the R&T laboratory facilities would be separated from the wastewater pretreatment facility, wastewater from these facilities would be discharged to one of the existing pretreatment facilities in the 200 Area, which would be modified to accommodate the new waste stream. The displaced parking from the North Parking Lot would be accommodated by construction of a multi-level parking deck in the North Parking Lot. The H/C plant expansion would be added to Building 106.

3.2.4 Site Plan No. 4 - 400 Area with South Parking Deck

This site plan is similar to Site Plan No. 3 (Section 3.2.3), except that the displaced parking from the North Parking Lot would be accommodated by construction of a multi-level parking structure in the South Parking Lot (Figure 3-4).

3.2.5 Site Plan No. 5 - 200 Area Laboratory Renovation

In this site plan, existing laboratory and administrative spaces in Buildings 202, 204, and 205 would be expanded by construction of additional floors. The emergency response facility, clean room, industrial wastewater treatment plant, and any additional laboratory requirements would be constructed in separate buildings in the North Parking Lot, the 400 Area, or in a combination of these areas. Parking decks may be required in the South or North Parking Lots, depending on the number of displaced parking spaces.

For this EA, it was assumed that a building would be constructed in the North Parking Lot to house the emergency response facility, clean room, and industrial wastewater pretreatment plant (Figure 3-5). Additional parking would be supplied by a multi-story parking garage in the South Parking Lot. There would be no construction in the 400 Area.

3.3 NO-ACTION ALTERNATIVE

The baseline established to evaluate the environmental and socioeconomic effects of receiving the ARL units are conditions at ALC at the time of arrival, as described in the Affected Environment, Section 4.0. NEPA documents refer to the continuation of existing conditions of the affected environment without the implementation of, or in the absence of, the proposed action as the no-action alternative. Inclusion of the no-action alternative is prescribed by the Council on Environmental Quality (CEQ) regulations as the benchmark against which Federal actions are to be evaluated. Because realignment of the ARL units is required by the 1990 Base Closure Act and must be implemented unless directed otherwise by Congress, a No-Action Alternative, or not moving these units, as required by the 1990 Base Closure Act, is not a feasible alternative.

4.0 AFFECTED ENVIRONMENT

Section 4.0 is divided into 14 subsections that describe existing baseline conditions at ALC. Since consolidation of ARL activities at ALC will not affect the easternmost portion of the facility (Buildings 500 through 505), site-specific information has not been included for this area.

4.1 SETTING

4.1.1 Installation Description

ALC occupies 136.7 acres in suburban Adelphi, Maryland, which is north of Washington, D.C. (Figure 4-1). The ALC complex is located in two counties, occupying 83.1 acres of southeastern Montgomery County and 53.6 acres of northwestern Prince George's County. ALC is bordered on the north by NSWC; on the west by the residential community of Hillandale; and on the south and east by Powder Mill Road, NRTC, Powder Mill Estates, and Paint Branch Park. Paint Branch Creek flows southeast through the center of ALC (Figure 4-2).

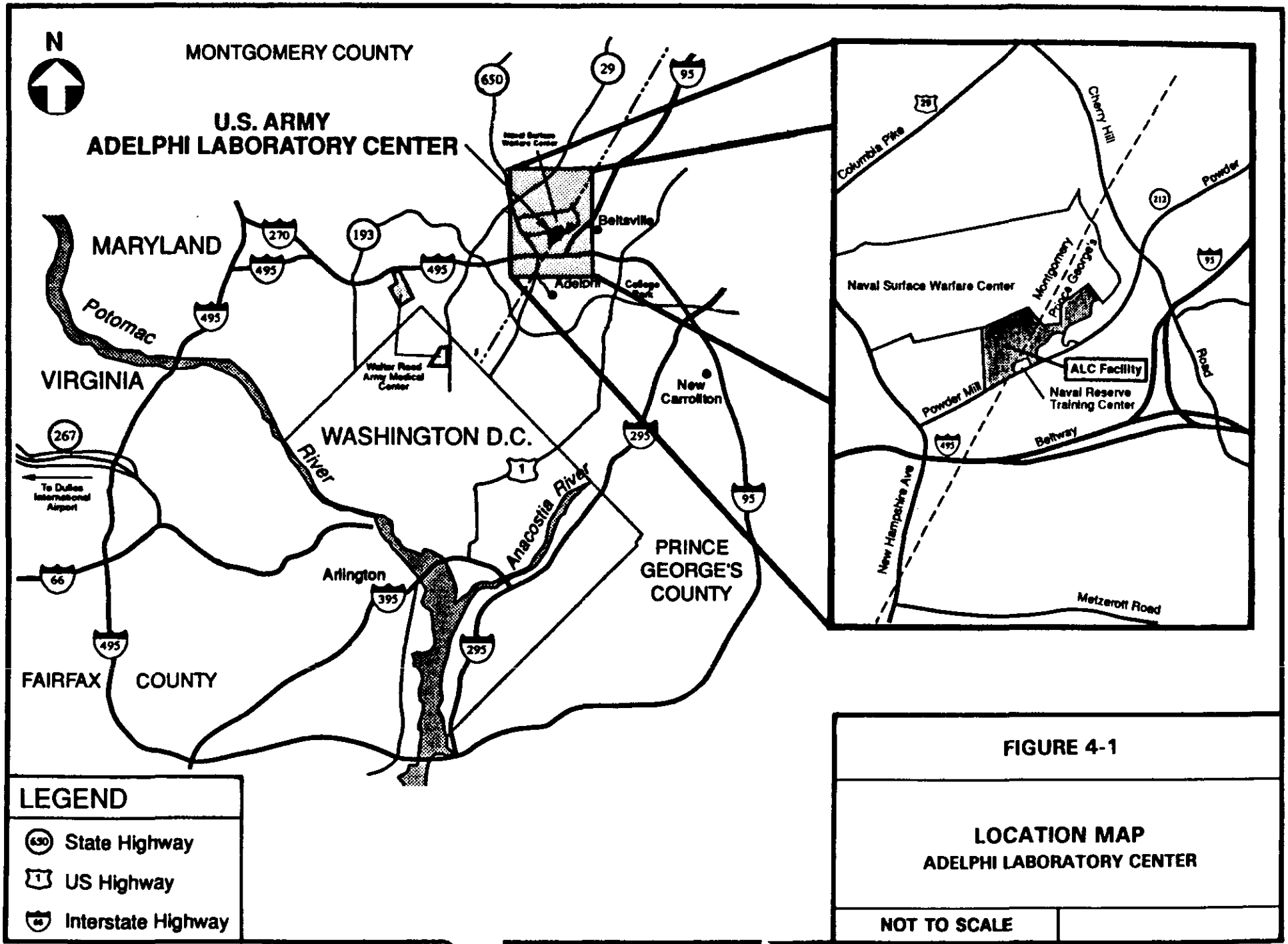
Originally designed and constructed in the early 1970's, the present ALC facilities are still serving their original design functions. These functions include: various laboratory research operations; effects simulation; electronic equipment development; industrial support operations; engineering services; handling/storage of toxic/hazardous materials/wastes; logistics; administration; maintenance; and staff offices. The ALC facility layout is presented in Figure 4-3. A description of the primary functions of the major buildings at the facility is provided in Table 4-1. The major organization and tenants at ALC, their mission and specialized activities are described in the following sections.

4.1.1.1 U.S. Army Laboratory Command

The U.S. Army Laboratory Command (LABCOM), soon to be redesignated the Army Research Laboratory (ARL), one of nine Major Subordinate Commands (MSCs) of the U.S. Army Materiel Command, is headquartered at ALC. LABCOM is responsible for four major missions and functions, including: support of Army materiel (equipment, apparatus, and supplies) needs and transferring the technology base to system applications; managing seven corporate laboratories and offices which are involved in a variety of research and development activities, including emerging technologies; managing specific programs and special projects; and commanding and controlling subordinate activities and installations in various geographical locations.

4.1.1.2 Harry Diamond Laboratories

HDL, a LABCOM corporate laboratory headquartered at ALC, functions as the Army's lead laboratory in providing nuclear weapons effects data and system vulnerability, hardening technologies and devices. HDL operates one of the world's largest gamma radiation simulators (Aurora) for the Defense Nuclear Agency.



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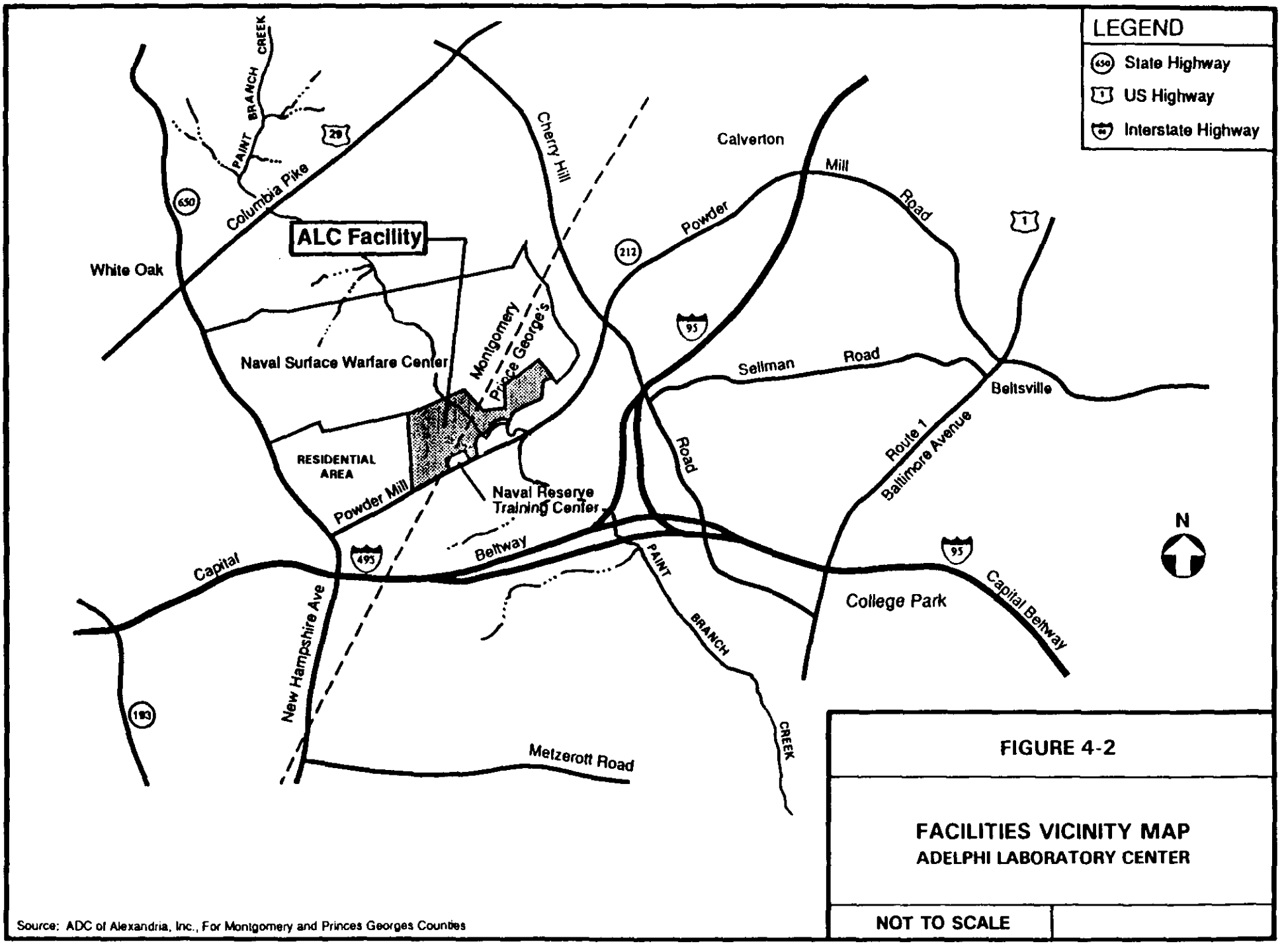
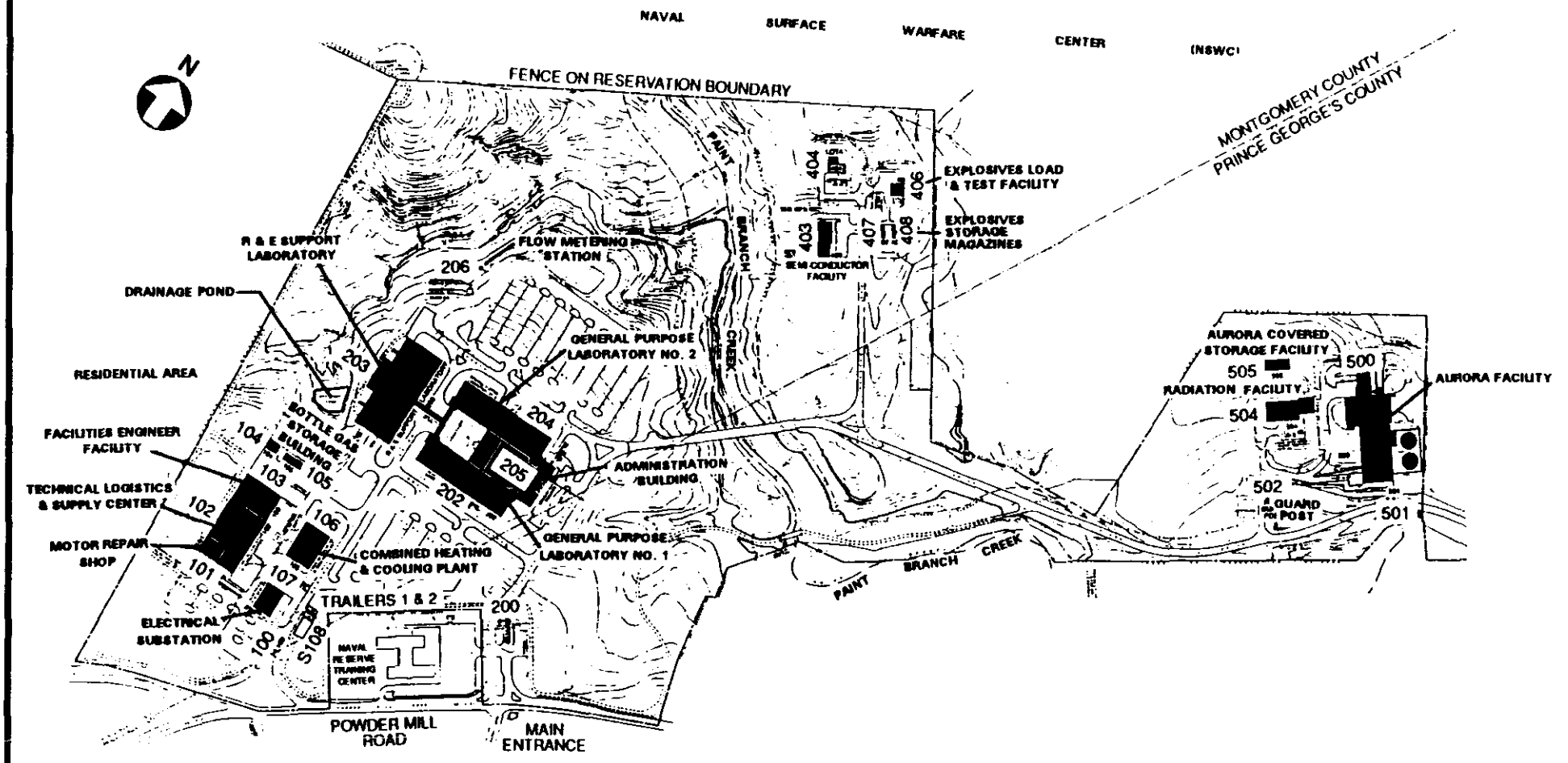


FIGURE 4-2

FACILITIES VICINITY MAP
ADELPHI LABORATORY CENTER

NOT TO SCALE

Prepared by Ebasco Services Incorporated for the U.S. Army Laboratory Command



LEGEND:

205 BUILDING NUMBER

300 0 300 600

APPROXIMATE SCALE IN FEET

Source: U. S. Army Corps of Engineers, Baltimore District, General Site Map, Drawing No. 18-08-37, Harry Diamond Laboratories 1982.

FIGURE 4-3

EXISTING FACILITY LAYOUT
ADELPHI LABORATORY CENTER

SCALE: AS SHOWN

TABLE 4-1
DESCRIPTION OF THE MAJOR BUILDINGS AT ALC

Building No. [1]	Present Function
100	Administrative, travel services
101	Motor Pool, provides maintenance of ALC grounds and heavy equipment vehicles
102	Receiving/handling/storage of supplies/equipment and toxic/hazardous materials
103	Facilities engineering offices and operations
104	Hazardous waste storage facility
105	Storage area for cylinders, compressed gas
106	Installation's primary heating and cooling operations.
107	Electrical power substation
Trailer Group 1 & 2	Administrative management
S-108	Administrative management, procurement
200	Access control to ALC
202	HDL facilities, primarily general purpose laboratories used for laboratory research and related research/administrative management/support
203	Research and engineering support laboratory. Industrial and research support type operations include wastewater treatment plants; machine shop; welding and sheet metal shop; electroplating shop; and a molding shop
204	Same as 202
205	LABCOM and HDL command, management, and administrative activities
206	Sanitary sewer flow meter for Washington Suburban Sanitary Commission (WSSC)
403	Semi-conductor Electronic Materials Technology Facility (SEMTF)
404	Office and computer support services
406	Fuze downloading facility
407 & 408	Explosives storage bunkers
500	Aurora facility for producing flash x-rays and high-power microwave pulses
501	Back gate security point
502	Sentry station for the 500 Area
504	Research activities involved with high intensity flash x-ray and gamma ray studies; the transverse electromagnetic pulse operation (TEMPO) high power microwave (HPM) pulser; HPM anechoic chamber; and a radioactive material/waste storage area
505	Electromagnetic radiation research

Notes: [1] Locations of buildings are shown on Figure 4-3.

HDL is also a primary laboratory for developing radar technology; developing new technology for signal/information processing; developing acoustics technology; designing reserve power supplies; and providing assistance to hardware developers through the design and application of advanced electronic fuzing.

4.1.1.3 Special Technology Offices

Three Special Technology Offices are located at ALC: the Survivability Management Office; the Low Observable Technology and Application Office; and the Signature, Sensors and Signals Processing Technology Office. The Special Technology Offices function as research management offices and do not participate in research and development operations potentially affecting the ALC environment.

4.1.1.4 Other Tenants

The U.S. Army Information Systems Command, the Special Security Detachment, the Civilian Employees Health Service, and the U.S. Army Test, Measurement, and Diagnostic Equipment Systems Support Operations are other tenants located at ALC. These organizations provide unique services in support of ALC activities.

4.1.2 Geographical Setting

ALC is located in Prince George's and Montgomery Counties, Maryland, approximately 10 miles north of downtown Washington, D.C., and approximately 26 miles southwest of Baltimore, Maryland (see Figure 4-1). The Montgomery County Seat is Rockville, approximately 11 miles to the west-northwest of ALC; the Prince George's County Seat is Upper Marlboro, approximately 18 miles to the southeast.

Most of the area surrounding ALC is moderately developed, especially to the south. The installation is located within one mile of the National Capital Beltway (Interstate 495 or I-495) and Interstate 95 (I-95) (see Figure 4-2). U.S. Route 29 is within two miles of ALC. Paint Branch Creek flows southeasterly through the center. ALC is within the Anacostia River watershed, which ultimately drains to the Chesapeake Bay.

4.1.3 Climate

Summers in the Adelphi, Maryland area are warm and humid and winters are mild; generally pleasant weather prevails in the spring and autumn. The coldest weather occurs in late January and early February, the warmest in late July. There are no well-pronounced wet and dry seasons. Thunderstorms often bring sudden and heavy rain showers during the summer months, and may be attended by damaging winds, hail, or lightning. During their northward passage, tropical disturbances occasionally influence the area's weather with high winds and heavy rainfall, but extensive damage is rare.

Precipitation is evenly distributed throughout the year. The greatest total annual precipitation for this area was 59.02 inches in 1972; the least was 28.86 inches in 1965. The

seasonal snowfall averages 24 inches but varies greatly from season to season, ranging from 44.6 inches in the 1963-64 season to 2.2 inches in the 1972-73 season.

Prevailing winds are from the south except during the winter months, when they are from the northwest. The windiest period is late winter and early spring. Winds are generally light during the night and early morning hours and increase to a maximum in the afternoon (U.S. Department of Commerce, 1977).

4.1.4 Land Use

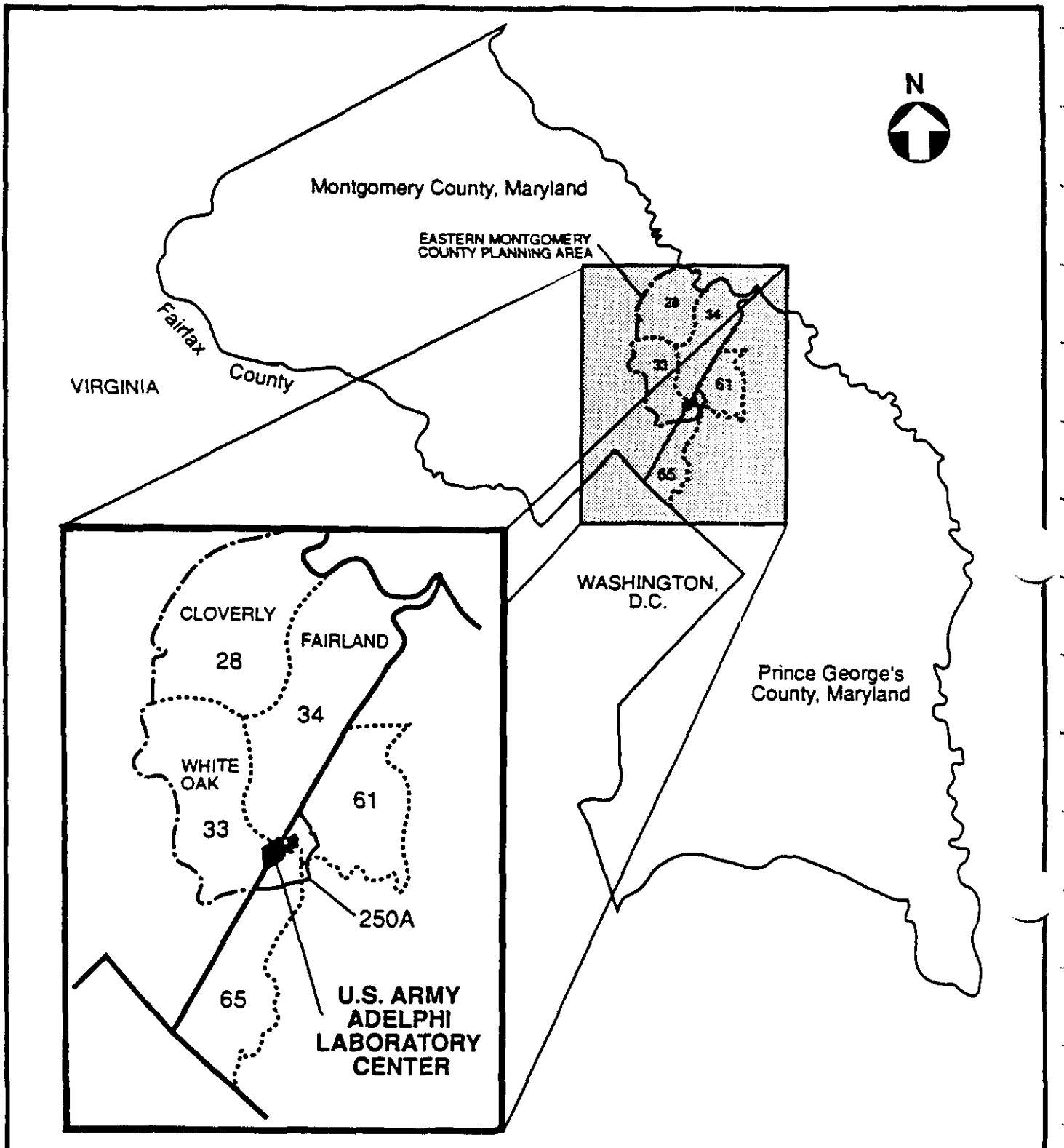
4.1.4.1 Planning Areas and Zoning

Counties address growth and development through analysis of distinct planning areas defined by community names and/or employment areas. For zoning purposes, these areas are further subdivided into designated use areas. In Prince George's County, ALC is located within Planning Areas 61 (Beltsville/South Laurel) and 65 (Langley Park) (Figure 4-4). ALC is located within Policy Analysis Zone 250A, which overlaps both planning areas. In Montgomery County, ALC is located within Planning Areas 33 (White Oak) and 34 (Fairland).

Zoning designations in the vicinity of ALC are shown in Figure 4-5. ALC is located within Open Space (O-S) zoning in Prince George's County. In Montgomery County, ALC is located within single-family residential (RE-2) zoning. Areas surrounding ALC in both counties are zoned rural residential (R-R) and single-family residential (R-90 and RE-2). Federal properties (NSWC, NRTC and ALC) and Paint Branch Park were reclassified from R-R to O-S zoning by the Maryland-National Capital Park and Planning Commission (M-NCPPC) in accordance with the Public Lands policy of placing parks and Federal lands in an O-S zone (Maryland-National Capital Park and Planning Commission, 1990).

4.1.4.2 Local Land Use

ALC is located in an area dominated by other Federal facilities (NSWC, NRTC, and the Beltsville Agricultural Research Center) and major residential areas (Hillandale, Hillandale Forest, Knollwood, and Cherry Hill and Powder Mill Estates). Land uses at ALC include research and development laboratories (industrial), offices and support facilities (installation support and industrial), undeveloped wooded land, and a wooded 150-foot buffer zone along Paint Branch Creek (Master Plan, General Site Plan #18-04-34, 15 February 1982, sheet 4/24) and the property line (open space). The buffer zone provides a natural property line partially blocking the view of ALC from the surrounding community. No buildings are allowed in this area (U.S. Army Corps of Engineers, 1991). Future land use plans continue established land use patterns, although single-family residential development and its associated population density are expected to increase. The majority of the ALC buildings are in Montgomery County, which has maintained RE-2 (low-density single-family residential) zoning for ALC and the surrounding Federal installation sites. As a Federal installation, ALC is not subject to local zoning ordinances.



LEGEND

—·— Policy Area
····· Planning Areas
—— Policy Analysis Zone (250A)

FIGURE 4-4

PLANNING AREAS AND POLICY ANALYSIS ZONES IN THE VICINITY OF ADELPHI LABORATORY CENTER

NOT TO SCALE

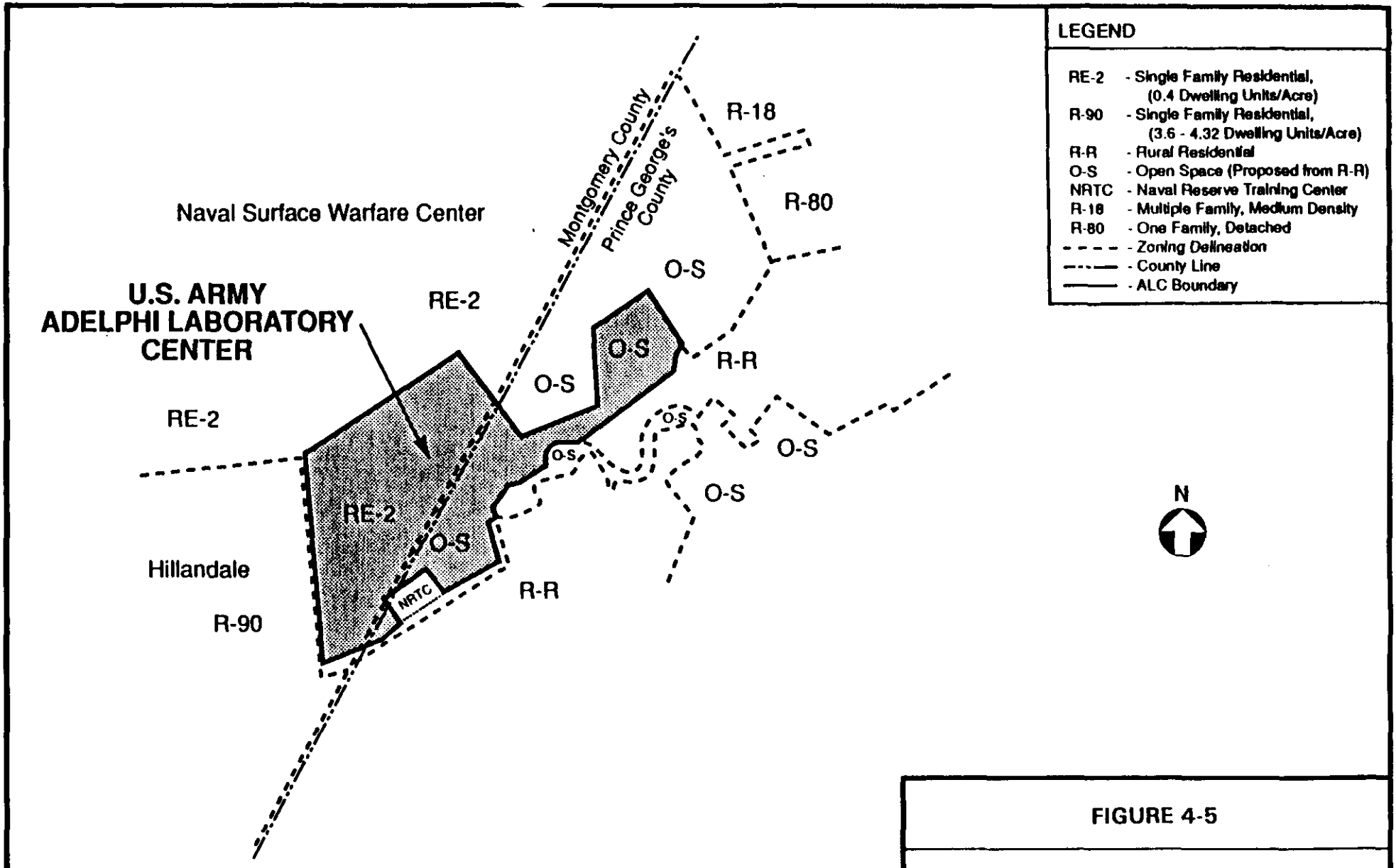


FIGURE 4-5

ZONING
IN THE VICINITY OF
ADELPHI LABORATORY CENTER

NOT TO SCALE

Source: M-NCPPC: April 1990 (Planning Area 61); December, 1989 (Planning Area 65); April, 1988 (Eastern Montgomery County)

Prepared by Ebasco Services Incorporated for the U.S. Army Laboratory Command

The National Capital Planning Commission (NCPC) serves as the central planning agency to coordinate development of Federal installations within the National Capital Region, which includes the District of Columbia, Montgomery and Prince George's Counties in Maryland, and four additional counties in Virginia. The NCPC reviews plans for proposed Federal facilities in the Maryland and Virginia counties within the National Capital Region.

4.1.5 Air Space Restrictions

There are no air space restrictions above or around the ALC complex.

4.2 AIR QUALITY

The U.S. Environmental Protection Agency (EPA) has established primary and secondary Ambient Air Quality Standards (AAQS) for six pollutants known as criteria pollutants (Table 4-2). Maryland also has an AAQS for fluorides, but it refers to concentrations in plants rather than in ambient air and is therefore not included in Table 4-2.

The State of Maryland has been divided into six air quality control regions. Montgomery and Prince George's Counties are located in Area IV, which is designated as "attainment" for particulate matter, nitrogen dioxide, sulfur dioxide, and lead. Prince George's County is designated as "non-attainment" for carbon monoxide and ozone, while Montgomery County is "non-attainment" for ozone county-wide, and for carbon monoxide in Rockville, Bethesda, and Silver Spring. This means that existing concentrations in the area are within the levels allowed by the AAQS for all of the criteria pollutants except for ozone and carbon monoxide in the locations specified.

According to the Maryland Air Quality Data Report (Maryland Department of the Environment, 1990), air quality monitoring data are available in Montgomery and Prince George's Counties at twelve locations. Data from these and other nearby monitoring stations for calendar year 1990 are summarized in Table 4-2. The air quality of Maryland since 1984 has either remained steady (particulates, nitrogen dioxide) or improved (sulfur dioxide, carbon monoxide, and lead). The ozone levels decreased between 1984-86, but increased in 1989-90.

No ambient air quality monitoring data are available for ALC. However, air quality is probably better at ALC than at most of the nearby monitoring stations because the monitoring stations are closer to major urban area pollution sources (i.e., areas of traffic congestion and industrial emissions).

4.3 WATER RESOURCES

4.3.1 Surface Water

4.3.1.1 Hydrology

ALC is drained by Paint Branch Creek, which flows southeasterly across the facility, and a small unnamed tributary of Paint Branch Creek, which flows west to east through the facility

TABLE 4-2
AMBIENT AIR QUALITY STANDARDS AND
EXISTING AIR QUALITY DATA

Pollutant/ Averaging Time	Ambient Standard [1]		1990 Monitoring Data	
	Primary ($\mu g/m^3$)	Secondary ($\mu g/m^3$)	Maximum Concentration ($\mu g/m^3$) [2]	Location Dist./Dir. [3]
Carbon Monoxide				
1-Hour	40,000	40,000	16,000	Bladensburg 6 mi/SE
8-Hour	10,000	10,000	9,000	Bladensburg 6 mi/SE
Sulfur Dioxide				
3-Hour	---	1,300	177	Riviera Beach 30 mi/NE
24-Hour	365	---	70	*
Annual	80	---	18	*
Nitrogen Dioxide				
Annual	100	100	35	Fort Meade 15 mi/NE
Ozone				
1-Hour	235	235	273	Greenbelt 5 mi/SE
Particulate (PM_{10})				
24-Hour	150	150	48	Hyattsville 5 mi/SE
Annual	50	50	27	Hyattsville 5 mi/SE
Lead				
Quarterly	1.50	1.50	.025	Cheverly 7 mi/SE

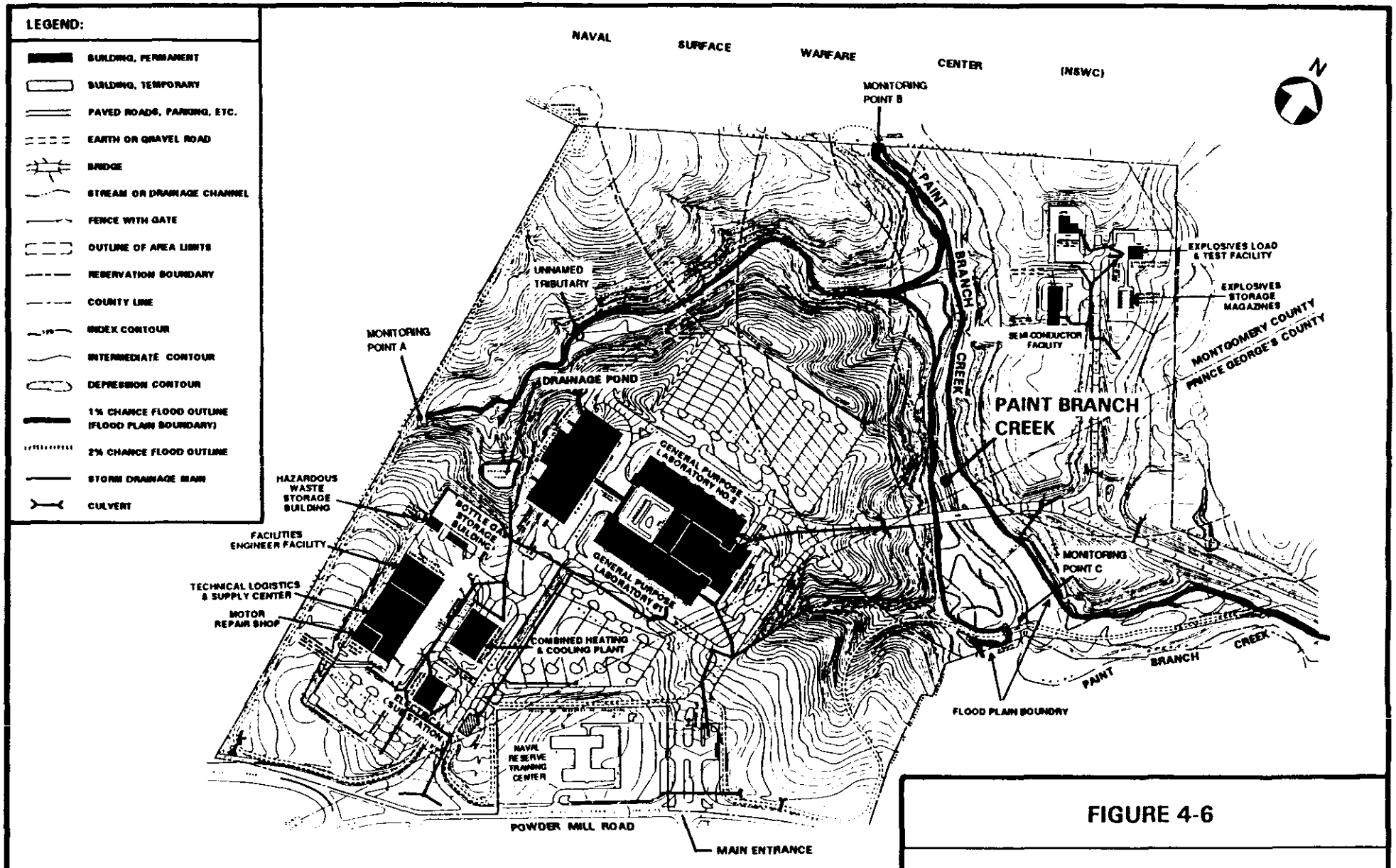
Notes: [1] Short-term standards are not to be exceeded more than once per year.

[2] Highest annual or quarterly and second-highest short-term values are listed.

[3] Distance and direction from ALC.

Source: Maryland Department of the Environment, 1990

(Figure 4-6). Paint Branch Creek originates approximately 6 miles above ALC and flows into the Northeast Branch of the Anacostia River at a point approximately 4 miles below ALC. The Anacostia River eventually discharges into the Potomac River, which in turn discharges into the Chesapeake Bay. Paint Branch Creek is a Piedmont stream characterized by undeveloped, tree-lined banks, substantial gradient, fairly fast moving currents, and cobble substrate above the National Capital Beltway (I-95), although sedimentation has been



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2. NO HISTORIC PLACES ARE NOTED ON THIS MAP.
3. CONTOURS ARE BASED ON SURVEYS PERFORMED BY MARYLAND SURVEYING AND ENGINEERING CO., INC. IN 1969 AND 1971. THEY ARE CORRECTED FOR "AS BUILT" GRADING.

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APPROXIMATE SCALE IN FEET

FIGURE 4-6

GENERAL SURFACE AND STORM DRAINAGE

ADELPHI LABORATORY CENTER

SCALE: AS SHOWN

observed. There is no stream gauge located on Paint Branch Creek and no flow measurements have been conducted at ALC.

The 100-year floodplain at ALC is confined to the stream valley and is mostly narrow because of steep-sided slopes (Figure 4-6). The Paint Branch Creek watershed includes urban land uses such as residential developments which discharge stormwater runoff to the Creek. Paint Branch Creek, itself, is part of a protected greenway corridor.

There is no stormwater management plan for ALC at present. Stormwater management at ALC consists of a series of storm drainage pipes and a drainage pond (Figure 4-6). ALC drains to seven outfalls and via a 36-inch pipe which discharges into the drainage pond west of Building 203. Three outfalls drain to the unnamed tributary of Paint Branch Creek north of Buildings 203 and 204, three outfalls drain indirectly into Paint Branch Creek, and one outfall drains to an unnamed tributary east of the 400 Area. The two stormwater discharges adjacent to and north of the North Parking Lot have contributed to erosion of the slopes in this area. There are no process wastewater discharges to Paint Branch Creek at ALC.

4.3.1.2 Water Quality

The State of Maryland water quality regulations establish water-use classes as follows (Code of Maryland Regulations (COMAR) - Title 10, Health and Mental Hygiene, Subtitle 50 - Water Management, Chapter 01 - Water Quality and Water Pollution Control):

Class I:	Water Contact Recreation, Aquatic Life, and Water Supply;
Class II:	Shellfish Harvesting;
Class III:	Natural Trout Waters;
Class IV:	Recreational Trout Waters.

Paint Branch Creek and its tributaries are designated as Class III: Natural Trout Waters by the State of Maryland, and are defined by the state as waters which have the potential for, or are suitable for, the growth and propagation of trout, and are capable of supporting natural trout populations and their associated food organisms as long as other habitat requirements are present. Native brown trout are present in Paint Branch Creek from its headwaters above ALC, down through ALC to the I-95 bridge (approximately 0.5 mile southeast of ALC).

During 1991, ALC established an internal quarterly surface water quality monitoring program for Paint Branch Creek to monitor effects of site activities on surface water quality. There are three monitoring points located directly outside the boundary of ALC (see Figure 4-6): monitoring point A is situated on the west side of the property boundary on the unnamed tributary; monitoring point B is located on Paint Branch Creek at the north end of the property boundary; and monitoring point C is located on Paint Branch Creek at the south end of the property boundary. Table 4-3 presents water quality data for Paint Branch Creek and its unnamed tributary, provided by ALC for 1991. The data and the presence of native brown trout indicate that the water quality is good. There are no data available for toxic/hazardous substances in the surface waters at ALC. No surface water on ALC is utilized as a potable water source.

TABLE 4-3
Surface Water Quality at ALC
(units in mg/l except where noted)

Date	4/26/91			8/2/91			10/21/91			12/24/91		
Monitoring Point	A[1/]	B	C	A	B	C	A	B	C	A	B	C
Total Dissolved Solids (TDS)[2/]	110	90	100	140	110	120	150	120	110	62	170	150
Nitrates (NO_3)	14	11	9.1	NR	NR	NR	2.1	1.1	1.3	26	46	21
Sulfate (SO_4)[2/]	19	11	8.5	<1.0	<1.0	<1.0	13	9.4	10	13	8.8	8.6
Specific Conductance (µmhos/cm)	4900	6600	130	170	140	150	220	20	6500	200	140	140
Ammonia (NH_4)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Oil & Grease	<1.0	1.2	<1.0	<1.0	1.3	1.6	2.5	1.4	3.2	NA	NA	NA
TPH	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0	<1.0	<1.0
pH[3/]	6.93	7.30	7.53	7.39	7.30	7.21	7.44	7.65	7.60	7.24	7.48	7.34

Notes: [1/] A -- Point A is located on the unnamed tributary of Paint Branch Creek on the west side of the property boundary.
B -- Point B is located on Paint Branch Creek at the north end of the property boundary.
C -- Point C is located on Paint Branch Creek at the south end of the property boundary.

[2/] Water quality criteria for protection of aquatic life are 500mg/1 for TDS and 250mg/l for SO_4(U.S. Environmental Protection Agency, 1986).

[3/] Maryland water quality standard for pH is 6.5 - 8.5.

NA--not analyzed
NR--not reported

Source: U.S. Army Laboratory Command, ALC Risk Management Office, 1992

Through an agreement with the NCPC, ALC has established a Protective Stream Clearance buffer, which extends 150 feet out to either side of Paint Branch Creek. ALC's policy to protect surface water quality entails prohibiting construction and land disturbing activities within the Protective Stream Clearance buffer, and stabilizing and revegetating all disturbed areas at ALC. ALC is not within the Chesapeake Bay Critical Area, as established under the Maryland Critical Area Program.

4.3.2 Groundwater

Sediment cover in the ALC area is too thin to form a usable aquifer. A french drain system is employed around and beneath Building 106 to reduce the elevation of the groundwater table.

One monitoring well exists on the far southwestern portion of the site near Building 101. Depth of water in this well is 8 feet, which probably indicates saturated conditions (Versar, 1989). Six monitoring wells were recently installed near Building 106. Depth of water in these wells typically ranges from 16-20 feet. Groundwater data from 1971 obtained from foundation borings indicated that groundwater in this area is deeper than 25 feet and is rarely encountered in the higher areas of the property. In higher elevations (near the 200 series buildings and the 500 series buildings), groundwater was not encountered at depths up to 50 feet. Water infiltrating the relatively permeable sediments and saprolite (decomposed rock) moves downhill to the lower areas, such as along Paint Branch Creek, effectively dewatering the higher areas most of the year (except in clay dominated areas). The underlying gneiss rock is essentially impermeable, except where fractured locally. The gneiss generally is not a source rock for groundwater or a subsurface pathway for groundwater to migrate off-site. Groundwater is not used as a potable water supply for ALC.

4.4 GEOLOGY, SOILS, AND TOPOGRAPHY

4.4.1 Geology

ALC is located at the Fall Line, the division between the unconsolidated sediments of the Coastal Plain and the much older crystalline rocks of the Piedmont. The Coastal Plain sediments form a wedge-shaped mass, which dips and thickens to the southeast, reaching a thickness of about 2,500 to 3,000 feet in southeast Prince George's County.

Several rock and sediment outcrops in the immediate vicinity of ALC have been mapped by Withington and Froelich (1974). Crystalline rocks of the Piedmont are represented by the Wissahickon Formation, a mica gneiss of Precambrian or early Paleozoic age. Saprolite commonly occurs at the top of the Wissahickon, except where removed by active erosion, and averages about 16 feet in thickness. Coastal Plain sediments are represented by the Potomac Group of Cretaceous Age, which is not subdivided into formations here but instead into a sand and gravel facies and a clay facies, by upland gravel and sand deposits of Tertiary Age, and by Holocene-Aged alluvium deposits along stream channels.

ALC is dominated by Potomac Group sediments (sand facies) in the southwest and northwest, and by rock and saprolite of the Wissahickon Formation through the central part of the property. Foundation boring logs indicate that sediments overlying the bedrock are thickest in the areas of higher elevation (45 feet beneath Building 203) and thinnest in low areas near the creek (8 feet). Numerous additional borings which exist for the site indicate that the sand, gravel, clay, and saprolite cover is very irregular, ranging in thickness from 0 to 30 feet, and is heterogeneous in composition.

4.4.2 Soils

Soils at ALC consist of five soil series: Beltsville, Sassafras, Croom, Manor, and Hatboro. The Beltsville series are nearly level, moderately well-drained soils with a perched water table and a fragipan (dense clay layer). The Sassafras series, where the North and South Parking Lots are located, also occurs in nearly level areas and exhibits a higher permeability due to its gravelly texture and the absence of a fragipan. The Croom series occurs on slopes of 8 to 25 percent and is generally characterized as excessively well-drained. The Manor series, where the 400 Area is located, consists of silty, loamy soils which occur on sloping areas and are well- to excessively well-drained. Hatboro soils are poorly drained, silty loams occurring in stream beds (Soil Conservation Service, 1990).

Several general trends are evident within the soils at ALC. Upland areas have deep, very permeable soils which are moderately to excessively well-drained and are subject to severe erosion. Soils on the intermediate elevations and slopes are generally shallower, overlying a dense fragipan, and resulting in impeded internal drainage. Soils in the low areas along stream valleys are poorly drained, silty loams. Figure 4-7 shows the various soil types at ALC.

4.4.3 Topography

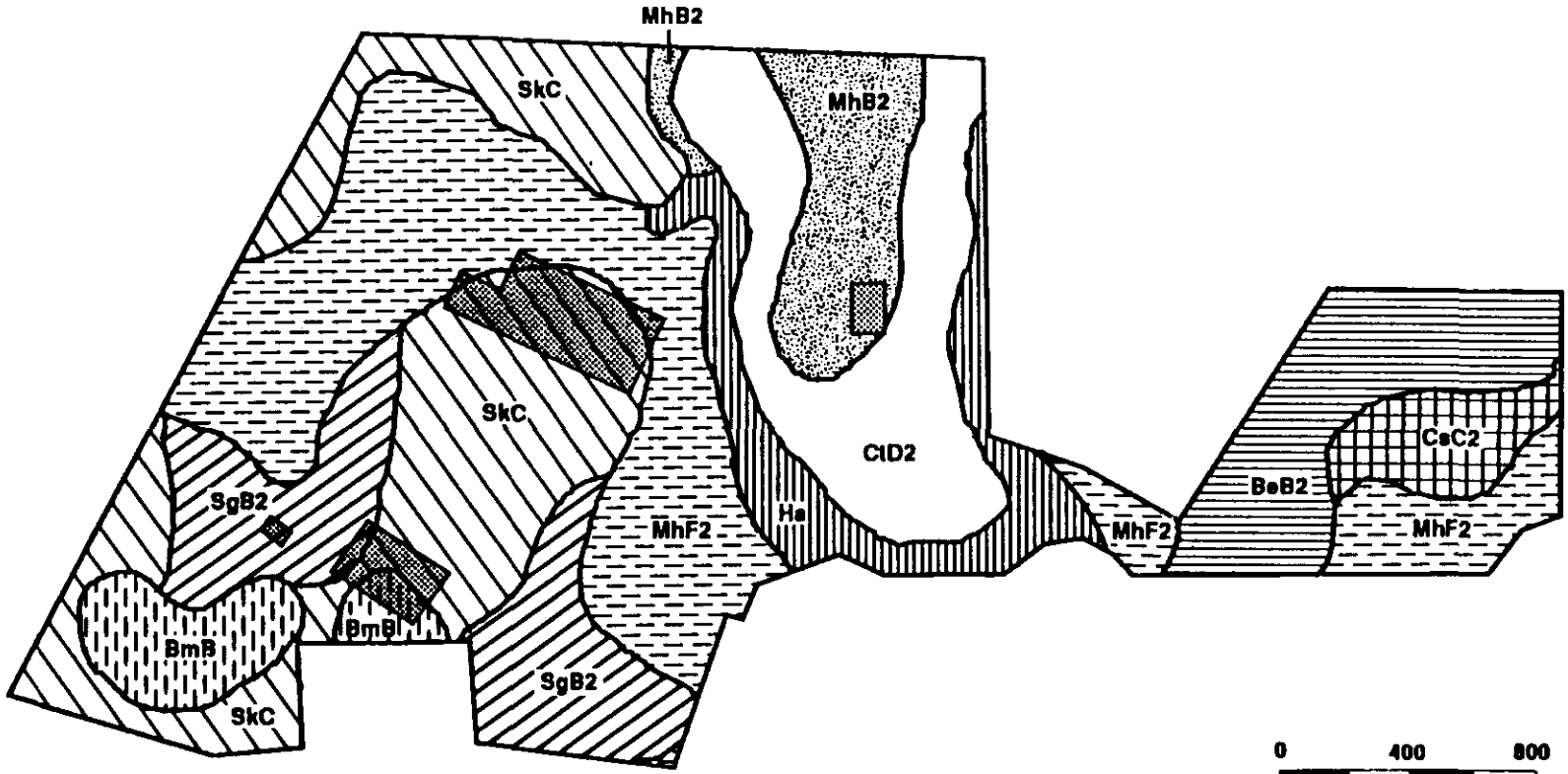
The ALC property consists of rugged terrain characterized by rolling hills, rock outcroppings, and the Paint Branch Creek valley. Elevations range from 138 to 276 feet above mean sea level (msl). The highest elevations are located near the 100 Area and 400 Area buildings, and at the westernmost corner of the ALC property. The lowest elevations are located along Paint Branch Creek. Slopes vary from 2 to 40 percent and are heavily wooded.

The North and South Parking Lots and the 400 Area are located on relatively flat land. However, slopes west of the North Parking Lot are steep.

4.5 INFRASTRUCTURE

4.5.1 Potable Water Supply

Potable water for ALC is purchased from the Washington Suburban Sanitary Commission (WSSC). Water enters the installation via a metering station at ALC from a 20-inch-diameter water main along Powder Mill Road and is distributed to the main area by a looped system of 10-inch lines. The 400 area is served by an eight-inch line. A recent utility study of the potable water system found it to be reliable and in good condition. There are



LEGEND:

SkC	Sassafras-Urban land Complex, 5-15% slopes
MhB2	Manor Loam, 3-8% slopes, moderately eroded
CtD2	Croom Gravelly, Sandy Loam, 15-25% slopes, moderately eroded
MhF2	Manor Loam, 25-60% slopes, moderately eroded
Ha	Hatboro Silt Loam
BeB2	Beltsville Fine Sand Loam, 2-5% slopes, moderately eroded
CsC2	Croom Gravelly Loam, 8-15% slopes, moderately eroded
BmB	Beltsville-Urban Land Complex, 0-5% slopes
SgB2	Sassafras Gravelly, Sandy Loam, 2-5% slopes, moderately eroded
	Approximate Area of North and South Parking Lots

FIGURE 4-7

SOILS MAP
ADELPHI LABORATORY CENTER

SCALE: AS SHOWN

Sources: U.S. Soil Conservation Service, 1961. U.S. Soil Conservation Service, 1967

no flow or pressure problems during normal operations. Although the present system will meet the volume demand for fire flow, the utility study determined that the net pressure available (i.e., residual pressure) does not meet the fire protection requirements for the multiple-story buildings in the 200 Area. The study concluded that fire pumps are required for Buildings 202, 203, and 204.

Water consumption levels for fiscal years 1990 and 1991 were 44.4 million gallons and 48.9 million gallons, respectively. This usage includes water from laboratory, domestic, lawn irrigation, and cooling tower operations. It does not include the water supplied by ALC to NSWC (U.S. Army Corps of Engineers, 1992).

4.5.2 Wastewater

ALC is equipped with a sanitary sewer system network which connects with and discharges into WSSC's sewer system. Sanitary wastewater is composed primarily of wastewater from cafeteria operations; restroom and laboratory sinks; industrial equipment cooling; and pretreated effluent from three (3) neutralization sumps and two (2) small industrial wastewater pretreatment facilities. The laboratory sink wastewater goes through pretreatment before it is discharged into the sanitary sewer. Sewage is metered and sampled in a flow metering station prior to exiting the installation and discharging to a 10-inch WSSC line.

Because ALC generates and discharges treated industrial wastes into the sewer system, WSSC categorizes ALC as an industrial discharger. WSSC has established pollutant effluent limits and periodic monitoring for specific parameters (Discharge Authorization Permit No. 00166). Table 4-4 shows the effluent limits and monitoring requirements established by WSSC. Compliance reports are submitted to WSSC in September and March of each year. Additionally, WSSC reserves the right to enter the facilities, inspect treatment processes, collect samples, and view records. ALC has been successful in meeting the permit requirements with the exception of one Notice of Violation (June 1990) for a one-time occurrence of excessive zinc during one sampling period.

There are two small industrial pretreatment facilities located in Buildings 202 and 203 and three elementary neutralization sumps located in Buildings 202, 203, and 204. These facilities treat wastewater generated from specific laboratory and research operations, including metal plating, printed circuit (PC) board production, and photography developing. The location and type of treatment for each system is listed in Table 4-5.

The ALC monitoring report for June 1989 through May 1990 shows a total volume of 39,975,000 gallons of wastewater discharged to the WSSC sewer (approximately 160,000 gallons of wastewater per ALC work day). This would equate to an average flow velocity in the 10-inch WSSC sewer line of about 0.5 feet per second, which is well within the flow capacity of the line. The quantity of wastewater is an insignificant percentage of the available WSSC wastewater treatment capacities (i.e., less than 0.1 percent).

TABLE 4-4
WSSC Discharge Limitations

Pollutant	Daily Maximum	Self-Monitoring Required[4/]
Cadmium (total)	1.30 mg/l	X
Chromium (total)	7.00 mg/l	X
Copper (total)	4.50 mg/l	X
Cyanide (total)	1.30 mg/l	X
Lead (total)	0.70 mg/l	X
Nickel (total)	4.10 mg/l	X
Silver (total)	1.20 mg/l	X
Zinc (total)	4.20 mg/l	X
Total Toxic Organics[1/]	2.13 mg/l	X
Dissolved Solids	1500 mg/l	X
Suspended Solids	400 mg/l	
Total Solids	1900 mg/l	
Biological Oxygen Demand	300 mg/l	
Fats, Oils, Grease[2/]	100 mg/l	
pH[3/]	6.0-10.0	
Chemical Oxygen Demand	500 mg/l	
Temperature	150°F	

Notes:
1/ Total Toxic Organics shall consist of the summation of toxic organics with values greater than ten (10) micrograms per liter. Toxic Organics shall consist of the EPA designated priority pollutants excluding inorganics and cyanide.
2/ Fats, wax, grease, or oils of animal or vegetable origin, whether emulsified or not.
3/ pH must be analyzed on an hourly basis as a grab or on a continuous strip chart recorder.
4/ All parameters indicated by "X" shall be analyzed and reported. Compliance with all other parameters shall be maintained at all times.

Source: WSSC Discharge Authorization (No. 00166) for ALC

4.5.3 Solid Waste

During 1991, approximately 500 tons of solid non-hazardous waste from ALC activities were disposed of using contractor services. All such waste is transported to the Brown Road Station Landfill in Prince George's County. The installation is currently investigating the implementation of a recycling program to reduce the solid waste.

4.5.4 Transportation

Transportation facilities in Montgomery and Prince George's Counties include roadways, public transportation, and air services. Figure 4-8 shows major transportation modes leading to ALC.

TABLE 4-5
Wastewater Pretreatment Facilities at ALC

Plant Number	Industrial Location	Source of Waste	Type of Treatment
1	Building 202	Printed circuit board shops	pH adjustment and heavy metal removal
2	Building 202	Lab sinks	pH adjustment only
3	Building 204	Lab sinks	pH adjustment only
4	Building 203	Electroplating operations	pH adjustment, heavy metal removal, and cyanide treatment[1/]
5	Building 203	Lab sinks	pH adjustment only

Note: 1/ Plant Number 4 is capable of treating cyanide-containing wastewaters; however, cyanide plating operations at ALC are no longer in existance.

Source: U.S. Army Corps of Engineers, 1992

4.5.4.1 Roadways

Major roadways surrounding ALC include I-95 and I-495 (the National Capital Beltway), U.S. 1 (Baltimore Avenue), New Hampshire Avenue (Maryland 650), Powder Mill Road (Maryland 212), and Cherry Hill Road. All of the roadways in the vicinity of ALC experience congestion during morning and evening commuter traffic hours (generally LOS value E or F).[1]

Access to and from ALC is provided by an entrance and an exit on Powder Mill Road (Maryland 212) which runs generally in an east-west direction and connects New Hampshire Avenue near the Beltway to the west with U.S. 1 to the east. Powder Mill Road carries an average daily traffic (ADT) of 11,000 vehicles, and operates at LOS value E during peak hours. The portion of Powder Mill Road within Prince George's County is planned to be widened between the Montgomery County line and U.S. 1.

ALC's principal entrance and exit on Powder Mill Road operates well. A traffic count at the site entrance, conducted on 22 January 1992, indicated that approximately 1,750 vehicles with

[1] Level of service (LOS) is a qualitative measure that describes operational conditions within a traffic stream and how they are perceived by motorists and/or passengers. LOS values range from A (best) to F (worst), with A generally characterized by little delay at intersections or free-flow conditions along multi-lane highways and freeways, E as the capacity limit of a roadway, and F as excessive delay and forced breakdown of flow.

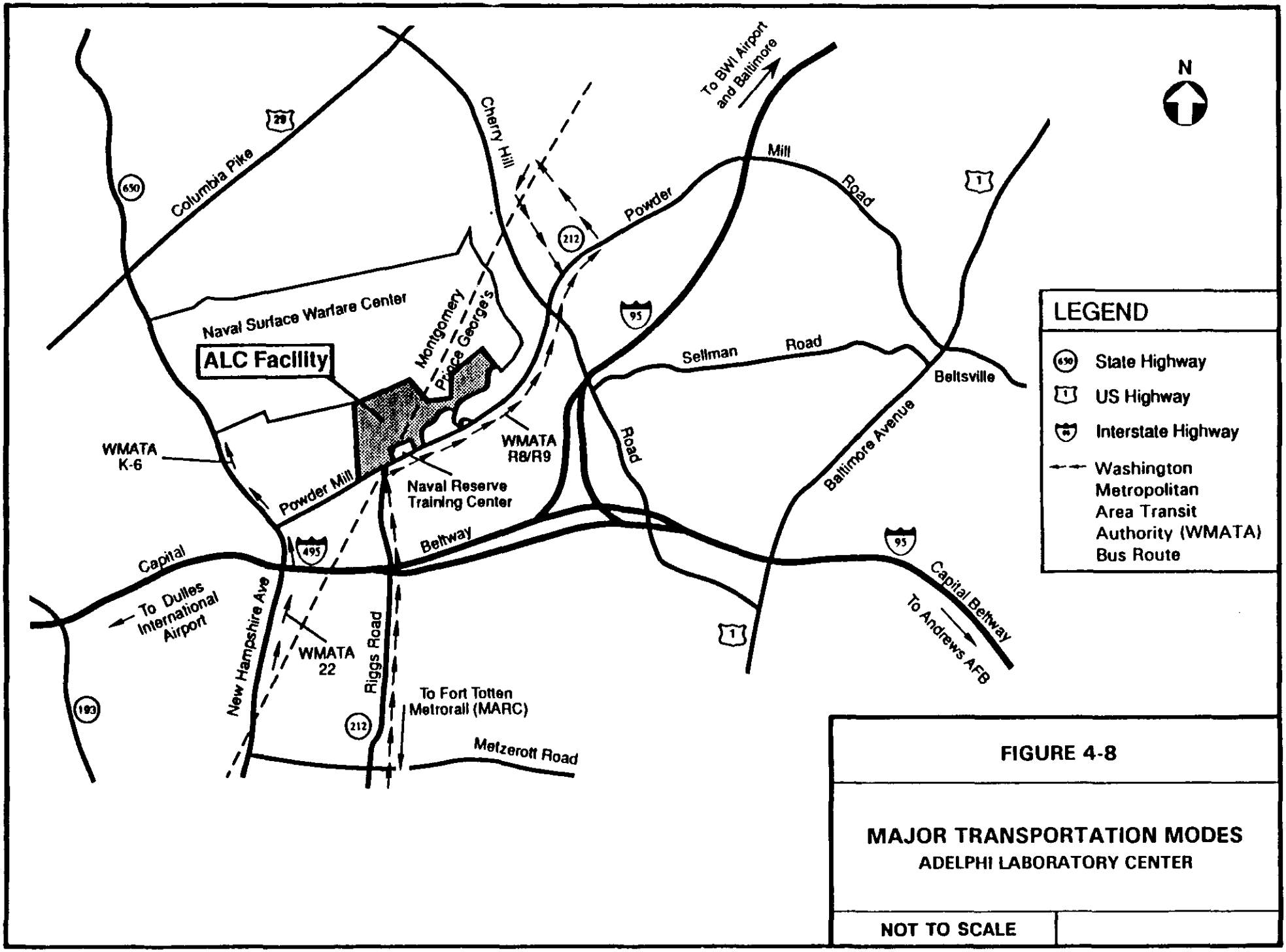


FIGURE 4-8

MAJOR TRANSPORTATION MODES
ADELPHI LABORATORY CENTER

NOT TO SCALE

Prepared by Ebasco Services Incorporated for the U.S. Army Laboratory Command

an occupancy rate of 1.2 persons per vehicle enter and leave the facility during a twenty-four hour period. Of these, approximately 600 vehicles enter and leave the site during the peak morning (6:45-7:45 a.m.) hours and 550 vehicles enter and leave during the evening (4:15-5:15 p.m.) hours. There is a rear gate access via the NSWC opened from 7:00 to 9:00 a.m. and 3:00 to 5:00 p.m. for personnel coming to or leaving work. However, observations indicated only minor traffic use through this gate due to the circuitous routing involved in access through the NSWC. To be conservative, data was gathered and analyzed at ALC's main point of ingress and egress.

On-site parking is provided in the North and South Parking Lots and on miscellaneous parking areas. Field observation indicates that the present parking facilities are inadequate to satisfy current demand (vehicles are parked out of designated spaces, on grassed areas and non-parking zones).

4.5.4.2 Railways

Rail service to downtown Washington, D.C. and other points is provided by the Washington Metropolitan Area Transit Authority Metrorail (Metro) Red Line, whose station at Fort Totten is approximately 35 minutes from ALC by bus. The Silver Spring Metro Station, although closer by car, requires a passenger to take two buses to travel to ALC.

The Maryland Rail Commuter (MARC) service operates between Washington, D.C. (Union Station) and Perryville, Maryland, and Martinsburg, West Virginia; the closest stations to ALC are Silver Spring on the West Virginia Line, and College Park and New Carrollton on the Northeast Corridor Line. Amtrak service from the Northeast Corridor and nationwide is provided to New Carrollton or Union Station. There are no railroad facilities on ALC.

4.5.4.3 Aviation

Three major commercial airports, two military airfields, nine small airfields, and two helicopter pads are in the vicinity of ALC. Commercial airports include the Baltimore-Washington International Airport, 23 miles north in Anne Arundel County, Maryland; Dulles Airport, 37 miles west in Loudoun and Fairfax Counties, Virginia; and Washington National Airport, 15 miles south in Arlington, Virginia. The airfields at Fort Meade (Anne Arundel County) and Andrews Air Force Base (Prince George's County) provide air cargo transportation. Seven small airfields and airports are available in Prince George's County and two in Montgomery County. Helicopter pads are located at NSWC and at NRTC.

4.5.5 Energy

Energy usage and distribution, including electricity, natural gas, fuel oil, and steam, are described in the following subsections.

4.5.5.1 Electrical Power

The installation is served by the Potomac Electric Power Company (PEPCO) under Utility Service Contract No. GS-00T-1595 (TP). Service is provided by two 69 kV 3-phase feeders

over two separate routes originating from one PEPCO substation, Mettzerott-east. Near the south exit gate of ALC, the overhead feeders are brought underground and run in conduit and duct to ALC's substation in Building 107. The substation, duct system, and all lines on the installation are owned and maintained by ALC. PEPCO owns the two 69 kV feeders (U.S. Army Corps of Engineers, 1982). During 1991, an average of 2,300,000 kWH of electricity was used per month.

4.5.5.2 Natural Gas

ALC purchases natural gas from the Washington Gas Company. The natural gas is used to fuel five boilers used for heating. No natural gas is distributed to the laboratory buildings.

Until mid-1981, the cafeteria in Building 205 used liquid propane (LP) gas from two 6,000-gallon underground tanks near Building 106. The LP gas system and both tanks were emptied at that time. The cafeteria currently uses LP tanks, located in the courtyard between Buildings 202 and 204, for cooking needs. Additionally, there is an LP gas line east of Paint Branch Creek which ends at the intersection of Floral Drive and Kuester Road. This line has never been used.

4.5.5.3 Fuel Oil

A total of eight underground storage tanks (USTs) with a total capacity of 75,000 gallons of No. 2 fuel oil are distributed throughout the western half of ALC as follows: two 20,000-gallon and one 25,000-gallon USTs adjacent to Building 106, one 6,000-gallon UST adjacent to Building 403, two 1,000-gallon USTs near Building 404, and two 1,000-gallon USTs near Building 406. Fuel oil is used for heating Buildings 403, 404, and 406. The three USTs (65,000 gallons) situated near Building 106 are used as a backup to natural gas for heating purposes. They are designed to hold approximately a 16-day supply of heating oil. During 1991, a total of 132,174 gallons of fuel oil was used.

4.5.5.4 Steam

Five boilers with a combined capacity of 55,000,000 BTU per hour burn natural gas as the primary fuel, with No. 2 fuel oil as the back-up fuel in case of a disruption of natural gas service.

The boilers generate high temperature water, which is distributed to the main building area at 380°F and 300 pounds per square inch. Eight heating water pumps with a total horsepower rating of 105 hp are capable of circulating 788 gallons per minute through a 6-inch-diameter steel pipe distribution system to the 200 Area. One 5,000,000 BTU per hour boiler is required during the summer months; two larger boilers, or 25,000,000 BTU per hour, are required during normal winter operations. Historical records indicate that extreme winter conditions have at one time required 37,500,000 BTU per hour of boiler capacity. Buildings on the site which are not served by the central heating/cooling plant (e.g., the 400 Area) have their own heating systems.

4.6 TRAINING AREAS

There are no field training areas at the ALC.

4.7 HAZARDOUS AND TOXIC MATERIALS

4.7.1 Hazardous Material Storage and Handling

A significant number of ALC research and development programs require the use of hazardous chemicals and materials. Operations involving the use of hazardous substances are performed in different laboratories and complexes throughout the facility. Those locations adjacent to the proposed construction sites include Buildings 101, 102, 103, 106, 202, 203, 204, and the 400 Area. Users of hazardous chemicals store in their own area the minimum quantity of materials necessary to perform their mission. The Energy Systems and Materials Branch is responsible for acquisition, inventory control, and storage of most hazardous materials used by ALC organizations. ALC has established a central chemical control facility (CCCF) in Building 204 for storage of these hazardous materials.

The CCCF is a secured room with controlled access. Ventilation, fire protection, and spill prevention measures have been incorporated into this facility. Chemicals stored in the facility are divided into seven major classifications: flammables, toxics, irritants, oxidizers, acids, bases, and non-reactives. Substances are stored in dedicated cabinets based upon their chemical properties and compatibility with other substances. A recent listing of chemicals stored in the CCCF included more than 1100 different compounds (U.S. Army Corps of Engineers, 1991). Pesticide chemicals and compressed or liquified gases are not stored in the CCCF; they are stored in dedicated facilities in Building 103 and Building 105, respectively.

In addition to managing the CCCF, the Energy System and Materials Branch also manages a chemical inventory of all chemicals and hazardous material stored and used at ALC. The computer-based chemical inventory includes quantities and locations of chemicals used at ALC as well as the identity of the user organizations. This Branch also manages a complete library of Material Safety Data Sheets (MSDS) for these chemicals, maintained on the computer and in hard copy.

4.7.2 Underground Storage Tanks

ALC manages a comprehensive installation-wide UST program. The ALC program complies with state and Federal regulations, and includes provisions to prevent leaks from USTs which store petroleum, petroleum by-products, or substances defined as hazardous.

ALC presently maintains an inventory of twenty-one USTs. Of this total, seven USTs are located in the 100 Area, four are in the 200 Area, five are in the 400 Area, and five are in the 500 Area. Table 4-6 provides a description of the USTs within the 100, 200, 400 and 500 Areas.

TABLE 4-6
Underground Storage Tanks in 100, 200, and 400 Areas

Location	Capacity (Gal)	Date Installed	Product	Leak Testing	Status
Building 101	550	1990	Waste Oil	Passed 18 Jan 91	Double-walled fiberglass tank with copper collection line. Replaced 500 gal. 1977 tank, removed from ground in February 1989. Soil sampling complete.
Building 101	6,000	1990	Gasoline	Passed 18 Jan 91	Double-walled fiberglass tank with fiberglass piping. Replaced 5,000 gal. 1977 tank, removed from ground in February 1989. Soil sampling complete.
Building 101	2,500	1990	Diesel	Passed 18 Jan 91	Double-walled fiberglass tank with fiberglass piping. Replaced 2,000 gal. 1977 tank removed from ground February 1989. Soil sampling complete.
Building 106 (Tank #3)	20,082	1975	#2 Fuel Oil	Passed 11 Dec 91	Steel UST with new fiberglass lines installed Nov.90, impressed current cathodic protection and monitoring wells.
Building 106 (Tank #4)	20,082	1975	#2 Fuel Oil	Passed 13 Dec 91	Steel UST with new fiberglass lines installed Nov.90, impressed current cathodic protection, GW monitoring wells, spill & overfill prevention.
Building 106 (Tank #5)	25,098	1977	#2 Fuel Oil	Passed 11 Dec 91	Steel UST with new fiberglass lines, impressed current cathodic protection and monitoring wells.
Building 106 (Tank #6)	25,098	1977	#2 Fuel Oil	Failed 13 Dec 91	Steel UST with new fiberglass, impressed current cathodic protection and monitoring wells. Tank was removed from the ground 21 May 1992. No contamination was found beneath the tank excavation. However, the MDE UST Division is requiring installation of a single groundwater monitoring well at this site.
Building 202	550	1970	Diesel	Scheduled	Scheduled for replacement with double-walled fiberglass tank in FY92 only if money is available after several other tanks are upgraded.
Building 203	550	1975	Diesel	Passed 25 Nov 91	Scheduled for replacement with double-walled fiberglass tank in FY92.
Building 204	550	1975	Diesel	Passed 25 Nov 91	UST scheduled for replacement in FY92.
Building 205	550	1990	Diesel	Passed 8 Aug 90	Replaced 1976 tank with double-walled fiberglass tank in FY 90 after a drop in diesel fuel level was observed. Three (3) recovery wells were installed and sampled 10 July 1991 with no detectable contamination found.
Building 403	6,000	1981	#2 Fuel Oil	Scheduled NLT Dec 96	Requires corrosion protection and spill/overflow prevention no later than December 1998. Tank is scheduled for upgrade during 1992.
Building 404	1,000	1975	#2 Fuel Oil	Passed 26 Nov 91	Scheduled for replacement in FY92.

TABLE 4-6 (Cont'd)
Underground Storage Tanks in 100, 200, and 400 Areas

Location	Capacity (Gal)	Date Installed	Product	Leak Testing	Status
Building 404	1,000	1980	#2 Fuel Oil	Passed 26 Nov 91	Scheduled for replacement in FY92. Both 1,000 gallon USTs at Building 404 are scheduled for replacement with one 2,500 gallon double-walled UST.
Building 406	1,000	1976	#2 Fuel Oil	Passed 3 Dec 91	Requires corrosion protection and spill/overflow prevention no later than December 1998.
Building 406	1,000	1981	#2 Fuel Oil	Passed 3 Dec 91	Requires corrosion protection and spill/overflow prevention no later than December 1998.
Building 500	10,000	1981	#2 Fuel Oil	Scheduled NLT Dec 93	Requires corrosion protection and spill/overflow prevention no later than December 1998. If funds are available after five other USTs are upgraded, then this tank will be upgraded in 1992.
Building 504	3,000	1976	#2 Fuel Oil	Passed 26 Nov 91	Scheduled for replacement in FY 92.
Building 504	4,000	1980	Radioactive Waste Water	Testing not required	Fiberglass tank containing about 500 gallons of uncontaminated water. Used to capture all water originating in the Co-60 Facility and Radiation Storage Area.
Building 504	1,000	1987	#2 Fuel Oil	Passed 16 Dec 91	Double-walled fiberglass tank. Passed 1987 testing. Monthly nonitoring of the leak detection system is conducted.
Building 505	550	1981	#2 Fuel Oil	Passed 16 Dec 91	

Source: ALC Risk Management, UST Inventory, 1992.

4.7.3 Polychlorinated Biphenyls (PCB) Management

The PCB Management Program at ALC complies with the requirements of the Toxic Substance Control Act (TSCA) of 1976. TSCA is applicable at ALC because of the presence of 38 transformers that contain 86 to 325 gallons of PCB dielectric fluid in concentrations greater than 500 ppm. Twenty-six of these 38 transformers are located in the 200 and 400 Areas. The objective of the PCB Management Program is to ensure that materials containing PCBs are used safely and in compliance with regulatory requirements, the scope of which include: marking, disposal, storage, decontamination, spill prevention and cleanup, and record keeping.

The ALC PCB Management Program includes provisions to remove and replace all of the PCB transformers maintained on the installation. As part of a two-phased initiative, all PCB transformers will be removed from ALC by fiscal year (FY) 1994. Phase I involves the replacement of 13 transformers by 1 December 1992, and Phase II involves the replacement

of 25 transformers by the end of September 1993. The schedule is reflected in a Draft Federal Facilities Compliance Agreement which is presently under negotiation between ALC and the EPA.

4.7.4 Asbestos Management

ALC has implemented an asbestos abatement program. Currently, mechanical rooms and certain fire-stop pipe sleeves extending through walls are being surveyed in various ALC buildings. Abatement is being conducted by a certified contractor, as necessary, based upon sampling results. ALC will develop an Asbestos Management Plan when abatement has been completed.

4.7.5 Pest Management Program

The pest management mixing and storage area in Building 103 consists of concrete block walls and a concrete floor and ceiling, with a cinderblock wall and metal door separating the mixing and equipment storage area from the pesticide storage area. The entire area is not subject to flooding and is designed to contain any spills that occur. Pesticide rinse waters are used as diluents during mixing, which is performed on the day of application, normally at the job site. Empty pesticide containers are triple rinsed prior to disposal.

4.7.6 Contaminated Sites

Two contaminated areas have been identified on the ALC installation. The first is an area adjacent to Building 106 where No. 2 fuel oil spilled during fuel transfer operations. The second involves two PCB transformers, both of which leaked PCB contaminated fluid onto the cement pad and associated soil in a small area adjacent to Building 406.

In the first instance, ALC personnel discovered in late December 1991, that an underground drainage channel on the north end of Building 106 was contaminated with No. 2 heating oil. It is estimated that 500-1,000 gallons of oil were lost during fuel transfer operations approximately one year before, when new fiberglass piping was being installed on all of the Building 106 USTs. The majority of the lost fuel was confined to unsaturated soil within the immediate area, retarding contaminant migration until groundwater conditions fluctuated (i.e., higher water table).

As an interim method of remediation, ALC has been pumping and treating approximately 1,500 gallons per week of contaminated groundwater. Treatment involves oil/water separation followed by charcoal filtering of the separated water and direct discharge of the treated water to the ground around the building. The State of Maryland approved ALC's remediation approach and imposed effluent treatment restrictions for benzene; total benzene, toluene, ethylbenzene and xylene (BTEX); and napthalene; with effluent limitations of 5ppb, 100ppb, and 30ppb respectively. Treated groundwater has consistently met the effluent limits. ALC removed the UST responsible for the leak (Tank 6), excavated, and arranged for off-site disposal of contaminated soil. An improved oil/water separation system was installed, which will hasten the pump and treatment process.

The second contaminated area (Building 406) involves one PCB transformer which has leaked small amounts of PCB-contaminated fluid to the soil surrounding the transformers. The total quantity of leaked fluid has not been determined. Because PCBs tend to be immobile in soil, the contamination is expected to be confined to the immediate area around the two transformers. ALC is currently under contract (with a completion date of October 1992) for removal and replacement of the two leaking transformers and remediation of the contaminated soil.

4.7.7 Hazardous Waste Management

Under the provisions of the RCRA and State of Maryland regulations, ALC meets the criteria for and is classified as a hazardous waste generator. Recent generation data show that ALC has arranged with the Defense Reutilization and Marketing Office (DRMO) in Fort Meade, Maryland for off-site disposal of 16,200 pounds of hazardous waste during calendar year 1991. The types of waste typically fall into the following categories:

- Waste plating solutions
- Expired shelf life commercial chemicals (acids, bases, etc.)
- Spent laboratory solvents
- Waste laboratory solutions
- Metal-contaminated sludges from wastewater pretreatment.

Since hazardous waste is accumulated and stored at ALC for periods longer than 90 days, ALC is also subject to RCRA requirements for operators of hazardous waste storage facilities.

The CCCF, described in Section 4.7.1, also serves as a 90-day accumulation point for hazardous waste at ALC. Satellite accumulation points and generators of hazardous waste at ALC notify the CCCF personnel of waste requiring disposal. The CCCF personnel arrange for the physical transfer of the waste to CCCF, unless the material is in containers larger than 5 gallons; larger containers are transferred directly from the generator to Building 104 via Logistics. Hazardous waste is accumulated in the CCCF for 90 days or less, and all paperwork needed in order to deliver the waste to the RCRA storage facility is done during this period. Chemical analyses are completed, MSDSs are obtained, and profile sheets and turn-in documents are completed. Physical transfer of materials to the RCRA facility is then accomplished by CCCF personnel.

The hazardous waste storage facility for ALC activities (Building 104) is permitted through and operates in compliance with a Consent Agreement between ALC and the Maryland Waste Management Administration (29 October 1984); this is an interim situation awaiting state action on a pending RCRA Part B Permit Application. The facility is authorized to store various types of contained hazardous wastes (i.e, bottled, drummed, etc.). The building has three separate storage areas, each accessed from the outside by a steel door. The first storage area, Bay A, is used to store acids, caustics, oxidizers, and materials that react with water or steam. The second storage area, Bay B, is used to store flammables, combustibles, materials that react with oxidizers, acids, and/or their fumes, and toxics and irritants. The third storage area, accessed by a side door, is used only for the storage of spill response and

cleanup supplies. The maximum inventory of waste allowed in storage at any given time, based on the capacity of the storage areas, is 12,000 gallons in Storage Bay A and 3,950 gallons in Storage Bay B. These maximums allow sufficient capacity to contain 10 percent of the volume of all of the containers or the volume of the largest container, whichever is greater. The storage facility rarely contains more than 200 gallons of hazardous waste or one quart of acutely toxic waste.

Before the hazardous waste reaches its permitted volume in Building 104, DRMO is notified to provide a contractor to transport, treat, and/or dispose of the hazardous and other restricted wastes from the building. Approximately one shipment of waste is made every two to three months.

4.8 PERMITS AND REGULATORY AUTHORIZATIONS

Table 4-7 presents those permits that regulate ALC's current operational activities. Permits are managed by the Directorate of Risk Management.

4.8.1 RCRA Permit Part B

An approved RCRA part B permit is required for buildings used to store hazardous waste, as identified or listed in 40 CFR 261. ALC currently is awaiting the approval of its RCRA Part B permit application and is operating under a Consent Agreement between ALC and the Maryland Waste Management Administration (see Section 4.7.7).

4.8.2 Wastewater Discharge Authorization

There are no National Pollutant Discharge Elimination System (NPDES) permits for activities within the project area; however, there is a NPDES permit for a discharge from an oil/water separator for the Aurora Facility in Building 500. There is a discharge authorization provided by Maryland Department of the Environment (MDE) (Section 4.7.6), and a WSSC permit, which is not a regulatory permit, specifying effluent limitations.

4.8.3 Radiation Sources/Facilities

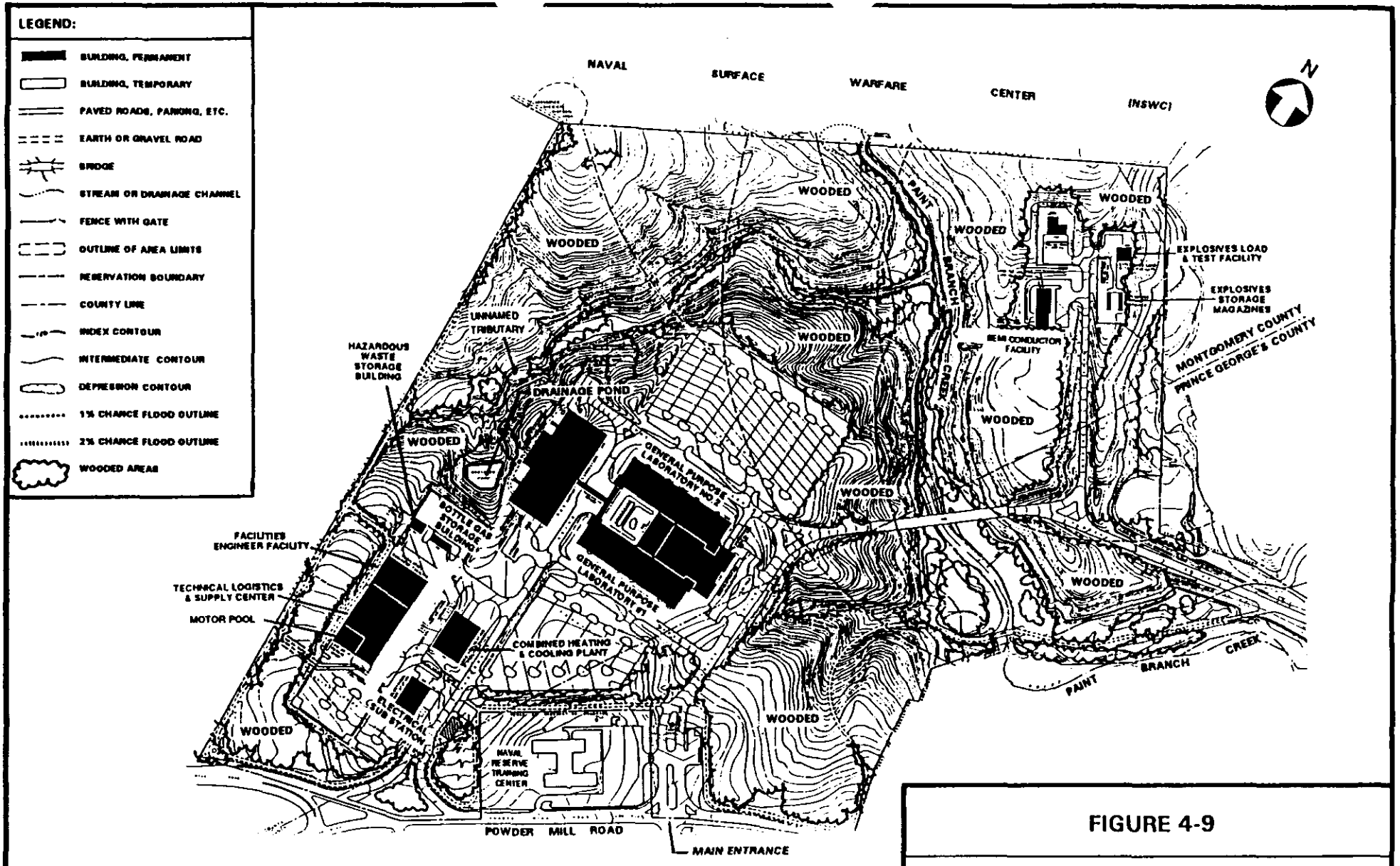
ALC has a number of NRC licenses and a Department of Army Authorization (DARA) for the use and storage of radioactive material (see Table 4-7). This includes the storage of millicurie quantities of radioactive material in the Radiation Storage Area (Building 504); the use and handling of microcurie quantities in Builings 202, 204, and 203; and kilocurie quantities of radionuclides in the Cobalt-60 Facility irradiator facility. The Cobalt-60 Facility is the only large quantity of radioactive material at ALC, and it is not located in the project area. ALC also operates electronic equipment that produces ionizing radiation, including the AURORA and High Intensity Flash X-ray (HIFX) facilities (Buildings 500 and 504, respectively). ALC also operates a variety of microwave and laser devices (nonionizing radiation), generally completely enclosed within specially designed containment facilities.

TABLE 4-7
EXISTING PERMITS AT
ADELPHI LABORATORY CENTER, MARYLAND

Medium	Permits Required	Expiration Date	Comments
Hazardous Waste	RCRA part B for storage facility	Application being reviewed	Operating under a Consent Agreement
Water	WSSC # 00166 (Industrial Discharge)	1/10/94	
	NPDES Permit No. 91-DP-2521	10/8/96	discharge authorization by MDE for effluent from the oil/water separator
	MDE Discharge Authorization	N/A	discharge authorization by MDE for Building 106 groundwater pump/treat system
Air	Boiler Permits	N/A	ALC has gas boilers; permits not required
Underground Storage Tanks	State Registration	N/A	Not permitted; USTs are registered with MDE
Radiation	9-17250-01	11/30/95	NRC License
	19-17250-04	4/30/96	NRC License
	19-17250-05	10/31/93	NRC License
	SNM 348	2/28/95	NRC License
	DARA A08-01-01	10/30/94	Army Authorization

4.9 PLANT, ANIMAL, AND AQUATIC ECOLOGY

Most of the ALC land area is developed. Natural habitat occurs along Paint Branch Creek, which constitutes a greenway corridor through the area, and in the northern and southeastern areas of ALC (Figure 4-9). The 400 Area, which is adjacent to Paint Branch Creek, is relatively undeveloped and supports natural habitat. The North Parking Lot is adjacent to a tributary of Paint Branch Creek. Except for the NSWC along the northern boundary, ALC is surrounded by dense residential development. NSWC, which is to the north, is relatively



NOTES:

1. THIS GRID IS THE COMMON GRID FOR BOTH THE WASHINGTON SUBURBAN SANITARY COMMISSION (WSSC) AND THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION (M-NCPPC).
2. NO HISTORIC PLACES ARE NOTED ON THIS MAP.
3. CONTOURS ARE BASED ON SURVEYS PERFORMED BY MARYLAND SURVEYING AND ENGINEERING CO., INC. IN 1966 AND 1971. THEY ARE CORRECTED FOR "AS BUILT" GRADING.

300 0 300 600

APPROXIMATE SCALE IN FEET

FIGURE 4-9

LAND COVER AND VEGETATION

ADELPHI LABORATORY CENTER

SCALE: AS SHOWN

Prepared by Ebasco Services Incorporated for the U.S. Army Laboratory Command

undeveloped, and provides an island of natural habitat within an urban setting. The Paint Branch Creek corridor connects the natural habitat on ALC with that on NSWC.

4.9.1 Plant Ecology

Vegetation cover at ALC consists of young mixed oak forest (dominated by oaks, American beech, and Virginia and loblolly pines) in upland areas, and bottomland associations (dominated by tulip poplar, sweetgum, red maple, and sycamore) in floodplain areas. Palustrine forested wetlands occur along Paint Branch Creek and its tributaries.

4.9.2 Animal Ecology

The wooded areas of ALC, including the 400 Area, provide habitat for forest dwelling wildlife, especially deer. The Paint Branch Creek corridor provides riverine habitat for various amphibians and reptiles. These areas provide valuable natural habitat within a generally developed area. The natural habitat at ALC is augmented by its connection with the larger natural habitat area at NSWC.

4.9.3 Aquatic Ecology

Paint Branch Creek is characterized as a coldwater stream, which is unusual in the project area. Native brown trout spawn in the headwaters above ALC, and adult brown trout, although sparse, do occur within ALC (personal communication, C. Gougeon, Maryland Department of Natural Resources (MDNR), 16 March 1992). Compared with warmwater fish species (which also occur in Paint Branch Creek), trout are relatively intolerant of high water temperature, low dissolved oxygen, and high sedimentation conditions. The Class III designation of Paint Branch Creek under Maryland water quality regulations (see Section 4.3.1.2) imposes requirements to protect the stream for trout, most notably in reference to water temperature, dissolved oxygen, and suspended solids.

Within ALC, Paint Branch Creek is characterized by undeveloped, tree-lined banks, and by a natural cobble substrate. Water flow rates, volumes, and turbidity levels fluctuate considerably, and summer water temperatures approach limits acceptable for trout. Sedimentation of the substrate has been observed. The Creek is affected by runoff from both on-site and off-site developed land.

ALC has coordinated with MDNR fisheries biologists to perform limited biological surveys of Paint Branch Creek at ALC, and to develop strategies for protecting and enhancing the trout habitat. Discussions have centered on measures to stabilize existing areas of erosion and to control sedimentation. Limited water quality sampling has been implemented (see Section 4.3.1.2).

4.9.4 Threatened and Endangered Species

In accordance with the requirements of the Endangered Species Act, coordination was conducted with the U.S. Fish and Wildlife Service (FWS) and the Maryland Natural Heritage

Program (NHP). No Federal or or state listed threatened or endangered species are known to occur at ALC (letter from J. Wolfin of U.S. Fish and Wildlife Service, 7 May 1992; letter from J. McKegg, Director of Maryland Natural Heritage Program, 3 April 1992) (Appendix C).

4.10 CULTURAL RESOURCES

The information in this section is based on a review of extant literature and field reconnaissance. Additional project-related archeological investigations are currently being conducted as part of the Army's compliance with Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966, as amended. The Army and the Advisory Council on Historic Preservation (ACHP) have signed a Programmatic Agreement to permit NEPA documents to be prepared prior to completion of Section 106 compliance (Appendix E). This allows the Army to proceed with the planning, design and preparation process required to implement the mandated realignments within the initiation dates required by the base closure statute, while continuing to fulfill NHPA responsibilities.

The agreement does not relieve the Army of its NHPA obligations. In those instances where it is not feasible to complete the actions required by Sections 106 and 110(f) of the NHPA prior to the NEPA decision, the Army will stipulate the specific areas of non-compliance in the Finding of No Significant Impact (FNSI) or the Record of Decision (ROD). The FNSI or ROD will specify that new BRAC construction, renovation, land disposal, or training exercises will not be undertaken until the actions necessary to inventory, assess, and take into account the effects on historic properties have been completed.

4.10.1 Archeological Resources

The range and extent of potential archeological resources at ALC span the entire known prehistoric and historic record of Maryland, going back in time to at least 11,500 years before present (B.P.). Much of this information has been previously summarized in An Archeological Overview and Management Plan for the Harry Diamond Laboratories - Adelphi, Maryland (Report No. 12) (Thunderbird Archeological Associates and Envirosphere Company, 1985) and in Harry Diamond Laboratories Cultural Resource Management Plan (Draft, 1991) (KFS Historic Preservation Group, 1991). Reviews of archeological site files maintained by the Maryland Historic Trust (Maryland State Historic Preservation Officer (SHPO)), conversations with local avocational archaeologists, and reviews of reports of several surveys which included parts of ALC, indicate that a number of prehistoric and historic sites have been reported in the vicinity of ALC. Several broken prehistoric stone tools have been discovered at ALC, but they have not been examined and their typological identities and provenances are not known. One potential historic site, the remains of a mill race possibly associated with Mrs. Harper's Woolen Factory, is located on the northern border of ALC along Paint Branch Creek. A mid-to-late 19th to early 20th century farmstead or tenant house site was identified near the main gate of ALC. Neither of the sites has been evaluated to determine their National Register eligibility.

Based on their topographic settings, a number of areas within ALC were identified as having the potential to contain prehistoric sites (KFS Historic Preservation Group, 1991). One area corresponds to the 400 Area; the others surround, but do not overlap, the existing facilities.

Much of the developed area of ALC has been previously described as 90% disturbed (Thunderbird Archeological Associates and Envirosphere Company, 1985), but this estimate of disturbance has not been verified by field investigations.

Phase I archeological investigations have been conducted in the 400 Area and in the area west of the North Parking Lot to determine the presence or absence of significant archeological resources. The Phase I investigations in the 400 Area identified potentially significant cultural resources. The investigations also identified the existence of artifacts in the area west of the North Parking Lot; however, it was determined that this area has been so extensively disturbed that the historic integrity has been compromised to the extent that the site would not meet National Register of Historic Places (NRHP) eligibility. The findings are being coordinated with the Maryland SHPO in accordance with the requirements of the NHPA. If the 400 Area is considered further for construction activities, additional Phase II investigations will be performed.

4.10.2 Architectural Resources

The structures which comprise ALC were constructed between 1969 and 1983. An architectural overview of ALC was conducted in 1984 (Building Technology and Historic American Buildings Survey/Historic American Engineering Record, 1984). None of the ALC buildings were recommended as being eligible for the National Register by this study.

4.11 SOCIOLOGICAL ENVIRONMENT

4.11.1 Demographics

ALC is located in the two most populous counties in Maryland. Montgomery County includes 495 square miles and four major towns: Bethesda, Gaithersburg, Rockville (the county seat) and Silver Spring. The County's 1990 population was 757,027 and by the year 2010 the population is projected to exceed 820,000 (Maryland Office of Planning, 1991a). Nearly 16 percent of the state's total population resides in Montgomery County, making it the most populated county in the state. Prince George's County includes 487 square miles and 28 municipalities. Six municipalities have populations greater than 10,000: Bowie, College Park, Greenbelt, Hyattsville, Laurel and New Carrollton. The county seat is located in Upper Marlboro. Prince George's County's 1990 population was 729,268 (Maryland Office of Planning, 1991b). By the year 2010 the population is projected to exceed 840,000. Nearly 15 percent of the state's total population resides in Prince George's County, making it the second most populated county in the state. The population distribution, by age, of the two counties is presented in Table 4-8.

TABLE 4-8
AGE DISTRIBUTION IN THE TWO-COUNTY AREA

Age	Montgomery County		Prince George's County		Maryland	
	Total	Percent	Total	Percent	Total	Percent
0-17	178,244	23.6	177,945	24.4	1,162,241	24.3
18-21	33,892	4.5	52,776	7.2	279,512	5.9
22-39	253,129	33.4	257,370	35.3	1,532,957	32.1
40-59	184,225	24.3	167,381	23	1,095,979	22.9
60-64	30,046	4	23,453	3.2	195,297	4.1
65+	77,491	10.2	50,343	6.9	517,482	10.8

Source: Maryland Office of Planning, 1991a and 1991b

4.11.2 Aesthetics

The suburban community surrounding ALC consists mainly of established residential neighborhoods with homes set back from the roadways on mature wooded lots. The region is mixed urban/rural with the wooded areas of NSWC, ALC, and other open space and parks providing a rural setting to the developing urban office and business growth along nearby highways and interstate corridors.

The ALC facility was built in the 1970's and is well maintained and landscaped. It is similar in appearance to other office park environments scattered throughout the region. There are no particularly distinguishing features or landmarks on or near ALC. Except for the view into the facility from the entry gates, the buildings or activities within the ALC complex are not visible from elsewhere in the community because of the 150-foot-wide wooded buffers which provide for visual isolation from neighboring communities.

4.11.3 Noise

The primary source of noise at ALC and the residential areas adjacent to ALC is vehicular traffic on Powder Mill Road, which is a heavily traveled street with an average daily count of about approximately 11,000 vehicles traveling at a speed of about 45 mph. Equivalent sound levels (L_{eq}) of 51 and 55 decibels, A-weighted scale (dBA) were measured in the North and South Parking Lots, respectively, on 20 November 1991 during the mid-morning hours when there was no activity in the parking lots; all the measured noise was from traffic on Powder Mill Road. Residences at similar distances from the road would be expected to experience similar noise levels. An L_{eq} of 53 dBA was measured in the 400 Area on 20 November 1991 and was attributable to traffic on Powder Mill Road. Approximately 1,100

vehicles enter and leave the ALC facility daily through the main entrance on Powder Mill Road. This traffic adds less than 1 dBA to the noise level generated by non-ALC traffic and is considered insignificant.

Infrequent research testing activities at ALC produce noises which can be heard outside the buildings. These include tests conducted in Building 406 in two small test chambers, tests conducted with the Aurora experimental vessel in Building 500, and tests using four ballistic simulators in the sub-basement of Building 203. The test chambers and walls of the buildings containing the chambers provide significant attenuation of the noise levels produced. Although the noise is generally audible outside the buildings during the infrequent testing, no complaints have been registered by area residents or facility staff. An outside public address system is used in conjunction with the Aurora facility tests to ensure that no personnel remain within a restricted area during a test. Although this announcement can be heard outside the nearby facility fence, the impact is not significant because the system is used so infrequently.

Other sources of noise include the carpenter shop in Building 103; the metal shop in Building 203; periodic tests of emergency electrical generators in Buildings 106, 202, 203, 204, 205, and 500; and normal operation of the heating, ventilating, and air conditioning (HVAC) systems associated with all of the buildings. Lawn maintenance, snow removal and general maintenance of streets and sidewalks produce the same types of minor noise associated with these outside activities at any campus or office park. None of these operations or activities produces excessive levels of noise, nor have they generated any noise complaints.

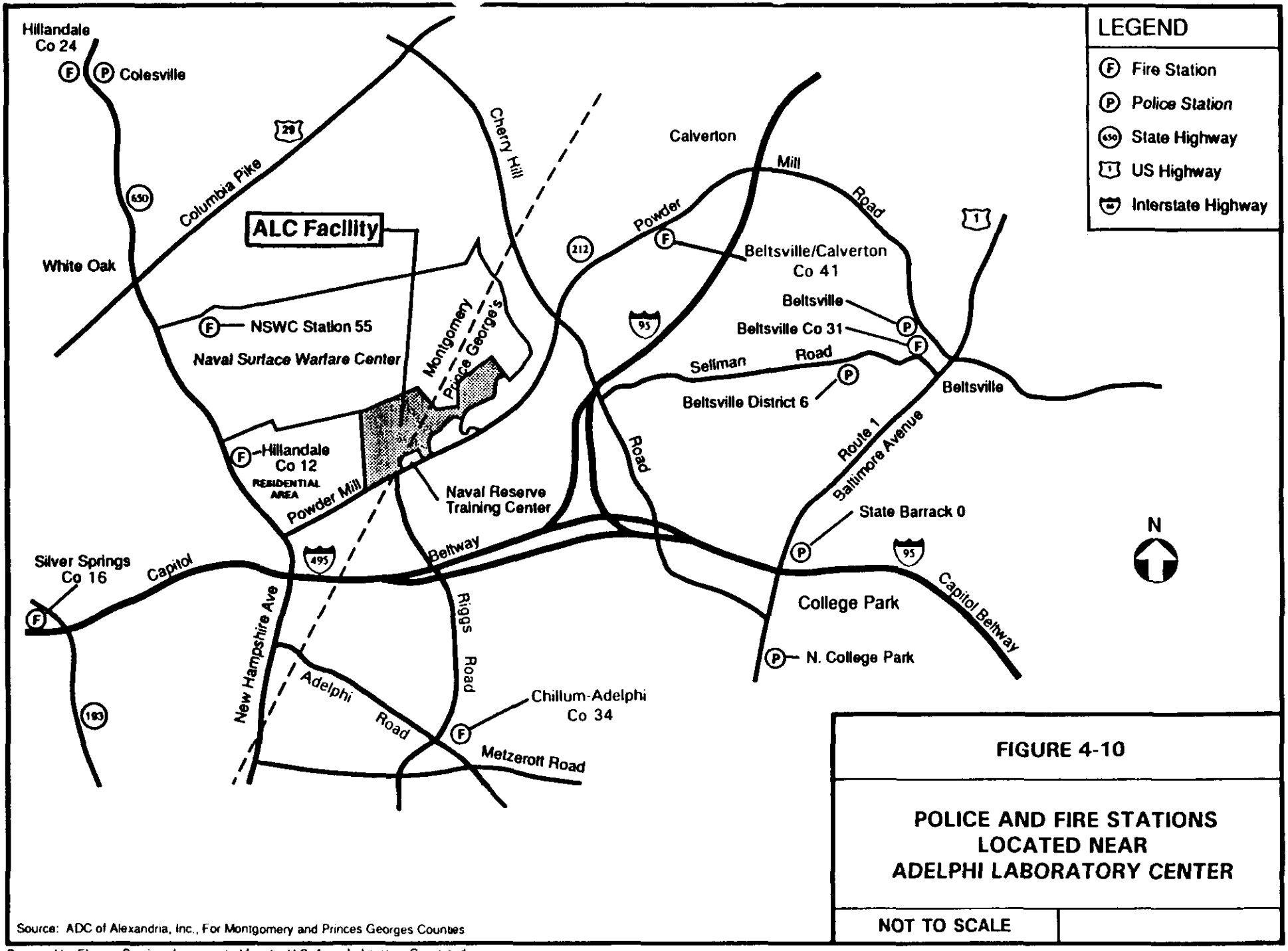
The State of Maryland has developed environmental noise standards based on the type of land use (Maryland Department of the Environment, 1983). Standards are presented for day/night noise levels (L_{dn}) as well as for maximum allowable noise levels on the receiving property. The L_{dn} standard is 55 dBA for residential property such as the Hillandale community adjacent to ALC. Maximum allowable levels for residential properties are 65 dBA during the day and 55 dBA at night. The maximum allowable noise level on a receiving residential property due to construction or demolition activities is 90 dBA during daytime hours and 55 dBA at night. Daytime hours are defined as the period between 0700 and 2200.

4.11.4 Odors

There is no documented odor problem at ALC.

4.11.5 Public Health and Safety

Figure 4-10 shows the locations of police and fire stations near ALC. Emergency services are available by dialing "41117" in the ALC telephone system. A nurse is located at the ALC on-site clinic in Building 205. During an emergency situation necessitating the evacuation of the facility, the ALC guard force is responsible for directing traffic out of the facility



Source: ADC of Alexandria, Inc., For Montgomery and Princes Georges Counties

FIGURE 4-10

POLICE AND FIRE STATIONS LOCATED NEAR ADELPHI LABORATORY CENTER

NOT TO SCALE

Prepared by Ebasco Services Incorporated for the U.S. Army Laboratory Command

through the main gate which exits from the South Parking Lot onto Powder Mill Road, or through the east gate which exits from the 500 Area onto Cherry Hill Road.

4.11.5.1 Police Service

The Law Enforcement and Physical Security Office at ALC enforces laws, orders, and regulations of the Center; provides traffic control, physical security inspections and civil disturbance control; prevents and investigates crime; and prepares and coordinates law enforcement plans in support of facility contingency plans. Additional police support is provided by the nearby Prince George's County Beltsville District 6 Station and by the Montgomery County Police, Silver Spring Station. The Beltsville District 6 Station, located three miles northeast of ALC on Sellman Road, has 72 sworn police officers with ten officers on duty at any given time. Car patrols conducted by one-man units can respond to an emergency call within four to five minutes.

4.11.5.2 Fire Stations

The NSWC Station 55, located off New Hampshire Avenue, would be the first to respond to an emergency at ALC. The station has one engine, one reserve engine, and 16 career firefighters on staff. Hillandale Company 12 (located on New Hampshire Avenue approximately 1.5 miles west of ALC) and Beltsville/Calverton Station 41 (located on Powder Mill Road approximately 1.9 miles northeast of ALC) is able to respond to an emergency at ALC within 3 to 4 minutes. Hillandale Company 12 has a staff of 26 firefighters (seven of whom are paramedics) working in shifts of five or six, two fire engines, and one ambulance equipped as a paramedic unit. Beltsville Station 41 has a staff of 46 firefighters working in shifts of three or four, two engines, and one ambulance equipped with basic life support. Additional fire support is available from Silver Spring Company 16, Beltsville Company 31 and Chillium-Adelphi Volunteer Company 34. NSWC/ALC rely on Montgomery and Prince George's Counties hazardous materials response teams in the event of an emergency involving hazardous materials at the facility (W. King, NSWC, Station 55, 10 April 1992; S. Price, NSWC, Station 55, 19 May 1992).

4.12 ECONOMIC DEVELOPMENT

4.12.1 Regional Economy

4.12.1.1 Regional Economic and Employment Characteristics

From 1984 until 1989, employment in the two-county area increased significantly with an average of over 31,000 new jobs per year. Sector-specific growth trends were similar to national growth trends. The largest growth in employment in the two-county area occurred in the services sector, which provided approximately 37 percent of all jobs created between 1984 and 1989. During the same time period, the retail sector accounted for nearly 17 percent of the counties' new jobs. The retail and service sectors are the two largest private sector employers in the two-county area, together employing 427,074 in 1989, 50.7 percent of total employment in the two-county area. The Federal, state, and local governments are

also large employers accounting for 20 percent of total employment. Table 4-9 illustrates employment patterns and the significant growth in the two-county area that has occurred since 1969, and particularly since 1984.

Present employment in the two-county area is estimated to exceed 850,000. As of March 1992, the unemployment rate was 3.6 percent in Montgomery County and 5.4 percent in Prince George's County compared to 7.3 percent for the State of Maryland and 7.3 percent at the national level. Both counties' unemployment rates in the past two decades have consistently been lower than those of the state and the nation.

Although both counties are comparable in size and population, Montgomery County's per capita income is one of the highest in the nation and exceeds Prince George's County's by over 60 percent.

4.12.1.2 Fiscal Structure

Annual property taxes collected in fiscal year 1992 by Montgomery and Prince George's Counties are expected to reach $686 and $330 million, respectively. Approximately $328 and $181 million, respectively, will also be collected by each county as its portion of state income tax revenue.

4.12.2 Installation's Direct Contribution to Local Economy

ALC's estimated annual non-salary expenditures exceed $27 million. This figure does not include any technical procurement expenditures and is composed of expenditures for utilities, services, supplies, and operational expenses. ALC employs 1,333 persons (1,294 civilians and 39 military), with an annual payroll of $62 million.

4.12.3 Military Force Structure

The primary organizations and tenants at ALC are described in Section 4.1.1.

4.13 QUALITY OF LIFE

4.13.1 Housing

4.13.1.1 On-Post Housing

There are no permanent on-post housing facilities and no plans to build on-post housing facilities.

4.13.1.2 Off-Post Housing

Vacancy rates for owner-occupied housing according to the 1990 census were 1.44 percent and 1.15 percent for Montgomery and Prince George's Counties, respectively. These vacancy

TABLE 4-9 EMPLOYMENT DATA FOR MONTGOMERY AND PRINCE GEORGE'S COUNTIES (COMBINED)				
SECTOR	1969	1979	1984	1989
Total Employment	405,663	593,152	687,639	844,123
Wage and Salary Employment	368,463	537,232	613,065	743,320
Proprietors	37,200	55,920	74,574	100,803
Farm Proprietors	1,308	1,606	1,667	1,420
Non-Farm Proprietors	35,892	54,314	72,907	99,383
Farm	2,178	2,803	2,377	2,033
Non-Farm	403,485	590,349	685,262	842,090
Private	270,802	424,029	528,235	673,123
Ag Serv., For., Fish., & Other	2,027	3,193	4,769	6,742
Mining	1,121	737	1,067	949
Construction	35,260	44,145	50,273	68,561
Manufacturing	16,508	22,681	28,943	31,550
Transportation & Utilities	10,759	15,355	18,744	34,137
Wholesale Trade	9,064	22,032	29,162	32,914
Retail Trade	79,133	113,815	130,944	156,927
Finance, Insurance & Real Estate	25,751	41,225	51,338	70,396
Services	91,179	160,846	212,995	270,947
Government and Govt. Enterprises	132,683	166,320	157,027	168,967
Federal, Civilian	57,390	69,272	67,188	67,344
Military	21,554	14,836	18,198	19,876
State & Local	53,739	82,212	71,641	81,747
Source: U.S. Bureau of Economic Analysis (BEA) Employment Time Series Data, 1969 - 1989.				

rates for housing demand fall within the acceptable range of between one and five percent set by the Office of Housing and Urban Development.

A comparison of housing prices in Montgomery and Prince George's Counties and the State of Maryland shows that Montgomery County housing is generally more expensive than for Prince George's County or the State of Maryland; Prince George's County housing is generally less expensive than State of Maryland housing. The average price for homes is $276,241 in Montgomery County, $136,386 in Prince George's County, and $155,809 for the State of Maryland.

4.13.2 Schools

Ten elementary schools, six secondary schools, and several private schools are located in the White Oaks and Fairland Planning Areas of Montgomery County, with adequate capacity forecasted through 1995. Springbrook High School and White Oak Jr. High School are the secondary schools closest to ALC, and are located approximately four miles to the northwest. Cresthaven Elementary School is less than two miles west, and Broad Acres Elementary School and St. Camillus Catholic schools are approximately two miles south of ALC.

Columbia Union College in Tacoma Park is approximately five miles south of ALC (Maryland-National Capital Park and Planning Commission 1981; 1988; 1989a; 1989b).

Thirteen elementary schools and three secondary schools are located in the Beltsville/South Laurel and Langley Park Planning Areas of Prince George's County. Sufficient capacity is forecasted for the area. High Point High School is located about two miles northeast of ALC; Buck Lodge Middle and Cherokee Lane Elementary Schools in Adelphi are about two miles south of ALC. The University of Maryland campus, which dominates the adult educational resources in the region, is located four miles south of ALC.

4.13.3 Family Support

Numerous family support services are available to the residents of both Montgomery and Prince George's Counties. Federal, State, and local public service agencies and programs offer family counseling, financial assistance, employment referrals, and emergency relief, among many other services. Family support services are also available through the local school systems, religious and civic organizations, and community volunteer programs.

4.13.4 Medical

Several hospitals and numerous medical centers are located within the two counties. In the event of an emergency at or near ALC, local emergency medical teams use the following hospitals:

- Holy Cross Hospital, five miles west of the ALC on Forest Glen Road in Silver Springs (at I-495, Exit 31, Georgia Avenue/MD 97);
- Washington Adventist Hospital, four miles south on Carroll Avenue in Tacoma Park (MD 195) at Flower Avenue (MD 787); and
- Montgomery General Hospital, about 12 miles northwest on Prince Phillip Road in Olney, Maryland (MD 182).

Trauma units are available at Suburban Hospital on Old Georgetown Road (MD 187) in Bethesda and at Med-Star at the Washington Hospital Center. Maryland State Police and Med-Star can provide helicopter transportation if required. Additional medical facilities are also available to military personnel at the Walter Reed Army Medical Center in Washington, D.C.

4.13.5 Shops and Services

Shops and services in the Montgomery and Prince George's County areas are adequate to meet the needs of county residents and those working in or visiting the area. Several major regional shopping centers provide a wide variety of consumer goods and restaurants, and offer family entertainment opportunities. Other retail stores, restaurants, and many hotels and motels are located in the area. Both counties offer public transportation, taxi service,

and automobile rental agencies. Other services include access to public libraries, daily and weekly newspapers, and cable television service. Gas and electric utilities, telephone service, water and sewage, and trash and garbage removal are also available in Montgomery and Prince George's Counties.

4.13.6 Recreation

The M-NCPPC is the principal agency responsible for the planning, acquisition, development, maintenance, and operation of the park and recreation system in Montgomery and Prince George's Counties. Figure 4-11 shows park and recreational facilities located in the vicinity of ALC. Recreational facilities include municipal parks, county recreation centers, campgrounds, golf courses, and community centers.

The stream valley park system, located along the streambanks of the Northwest Branch, Paint Branch, and Little Paint Branch Creeks, and the Patuxent River, provide a large expanse of water course and woodland in the two counties. In an effort to protect the stream valley and to meet the recreational needs of the public, both counties plan to increase park lands and facilities. Several recreational facilities are planned for construction between 1992 and 1995, including a bike trail, playground site, and the redesign of a community park.

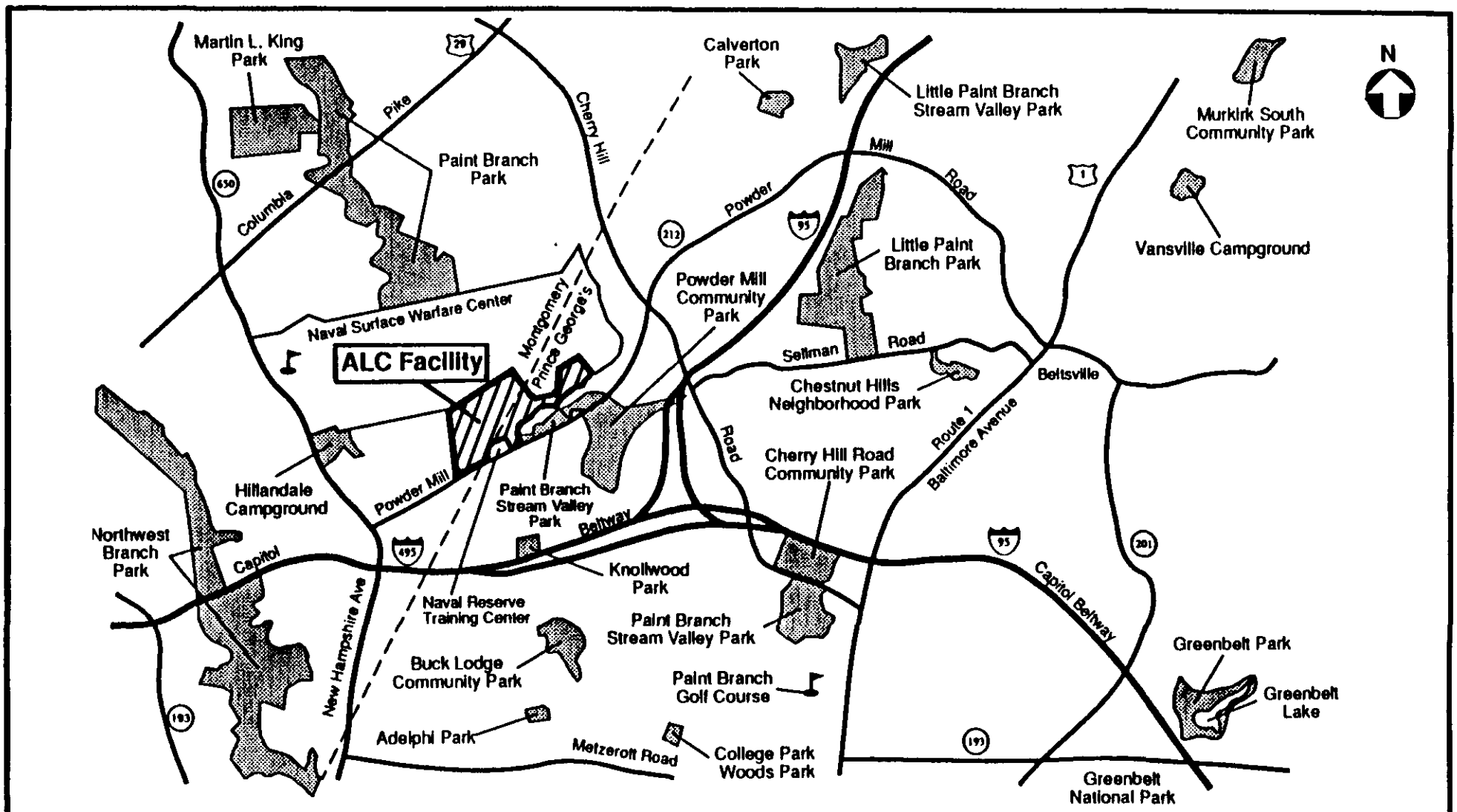
The ALC property offers nature trails for viewing wildlife in the scenic stream valley of Paint Branch Creek, designated on site as a nature sanctuary. The trails are a popular lunch-time retreat for employees, and picnicking is permitted. U.S. military services maintain bases throughout the National Capital Region, and all are accessible to military and, to some degree, civilian government employees. The NSWC exercise facility, golf course, softball field and archery area are available to ALC personnel (U.S. Army Corps of Engineers, 1991).

4.14 INSTALLATION AGREEMENTS

The following is a description of agreements between the ALC and any Federal, state or local agencies.

4.14.1 Chesapeake Bay Critical Area Program

DoD and EPA signed a cooperative agreement on 19 January 1989, aligning their 1984 Joint Resolution goals with those of the 1987 Chesapeake Bay Agreement. The significant goals of this agreement are: (1) to ensure full compliance with water quality requirements of the NPDES program; (2) to improve the operations and maintenance of wastewater treatment facilities through operator training programs; (3) to ensure that new development and construction are consistent with the President's goal of "no net loss" of wetlands; and (4) to improve non-point source (NPS) control methods to implement best management practices consistent with the state's NPS programs.



LEGEND

- State Highway
- US Highway
- Interstate Highway

FIGURE 4-11

PARK AND RECREATIONAL FACILITIES IN THE VICINITY OF ADELPHI LABORATORY CENTER

NOT TO SCALE

Prepared by Ebasco Services Incorporated for the U.S. Army Laboratory Command

The Maryland Critical Area Law establishes a resource protection program for the Chesapeake Bay. Although ALC does not come under the jurisdiction of Maryland's Critical Area Law, the installation is obligated under the 1990 DoD and EPA Chesapeake Bay cooperative agreement to integrate environmental planning requirements into the implementation plans of projects which could have potentially significant impacts on the Bay.

A 1971 agreement between ALC and NCPC resulted in the establishment of a 150-foot protective buffer on each side of Paint Branch Creek in the 1982 ALC Master Plan.

4.14.2 Forest Conservation Plan

ALC, as a Federal installation, is not under the jurisdiction of the Maryland Forest Conservation Law, nor under Montgomery or Prince George's County's Tree Preservation Ordinance. There is no formal agreement among ALC, the state or the county regarding forest conservation.

4.14.3 Public Health and Safety Agreements

In the event of an emergency, ALC has an Interservice Support Agreement with NSWC under which NSWC provides primary support for fire, ambulance, and radiological emergency service. Police and further fire support is provided on an as-available basis by the state and county police and local fire departments.

Walter Reed Army Medical Center has an Interservice Support Agreement with ALC to provide the following: (1) occupational health services to ALC employees; (2) medical uniform and towel laundry service; (3) non-radiological industrial hygiene services; (4) food service sanitation/water quality inspections; and (5) preventive medicine service.

4.14.4 Outdoor Recreation Cooperative Agreement

Under an Interservice Support Agreement between NSWC and ALC, NSWC makes recreational and athletic facilities available to ALC personnel.

5.0 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES

This section describes the environmental and socioeconomic effects that will be caused by construction of the ARL facilities at ALC and operation of the research and development activities. Section 5.1 discusses the environmental consequences of construction and operation on each resource. The impacts discussed generally apply to all site plans. However, where the impacts differ among the alternative site plans, the differences are discussed separately. Sections 5.2 and 5.3 present the socioeconomic consequences and mitigation actions respectively.

5.1 ENVIRONMENTAL CONSEQUENCES

5.1.1 Land Use

5.1.1.1 Construction Impacts

Construction will be phased to accommodate construction laydown on existing parking areas wherever possible and to minimize clearing and disturbing existing natural vegetation. For each site plan, loss of existing parking areas during construction will be temporary. Use of these paved areas during construction will be consistent with present land use, and because of the proposed plan for temporary offsite employee parking (see section 5.1.5.5), will not significantly affect the current parking situation. Construction and renovation of the 200 Area laboratory facilities will temporarily disrupt current laboratory activities. The disruption would be greatest with Site Plan No. 5 (200 Area Laboratory Renovation). Effects of construction activities will include temporary relocation of employees and alteration of vehicle and pedestrian traffic patterns. Safety considerations during construction will include provisions for handicap access and coordination with installation security.

5.1.1.2 Operational Impacts

Site Plans Nos. 1 (North Parking Lot, Single Building) and 5 (200 Area Laboratory Renovation) would affect land use minimally because the new facilities would be located either within existing renovated buildings, adjacent to existing buildings, or on the existing parking lots. Current land use would therefore not be appreciably changed.

Site Plans Nos. 2, 3, and 4 would not significantly change existing land use patterns, but operation of the new facilities would result in the loss of wooded land in Area 400 under Site Plans Nos. 3 and 4, and of an open area on the west side of the North Parking Lot under Site Plan No. 2. This loss would not be significant since less than 1 acre of undeveloped land would be converted to developed land use under Site Plan No. 2 and approximately 2 acres would be converted under Site Plan Nos. 3 and 4 out of the total 136.7-acre ALC facility. All site plans are consistent with the existing facility master plan.

5.1.2 Air Quality

5.1.2.1 Construction Impacts

During the construction period, unavoidable air emissions are likely to occur from construction-related activities. The most prevalent construction emission will be fugitive dust. Minor emissions of nitrogen oxides (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter, and volatile organic compounds (VOCs) also will be likely during construction. Emissions of these pollutants generally would be similar for all five site plans.

Fugitive Dust

Fugitive dust is generally defined as natural and/or man-associated dusts that become airborne due to the forces of wind or human activity. Construction-phase fugitive dust emissions will be generated during the demolition of the existing parking lot(s) and structures (if any), site clearing, grubbing and grading, excavation, and vehicular activity. The quantities of fugitive dust emitted by site construction vehicular traffic will depend on a number of factors, including the frequency of operations, the specific operations being conducted, and weather and soil conditions. A large number of the construction operations, such as site clearing and foundation excavation, will be intermittent and temporary.

The effect of heavy construction activities and site preparation on air quality will be short-term and confined to the immediate vicinity of the construction activity, because most of the fugitive dust created by construction traffic and earth-moving operations consists of relatively large particulates, which tend to settle quickly rather than remain suspended for long distances (i.e., normally within a few hundred feet). Therefore, because the ALC property line is at least 500 feet from the nearest construction area (excluding the NRTC), fugitive dust will not significantly affect residences located adjacent to the ALC property boundary. On-site impacts will be temporary and localized.

Other Air Pollutant Emissions

Total gaseous emissions released into the atmosphere during construction will be insignificant. Potential sources of VOC emissions include evaporative losses associated with on-site painting, refueling of construction equipment, and the application of adhesives and waterproofing chemicals. The frequency and duration of these activities probably will be limited with a minimal effect on air quality.

Exhaust emissions from construction equipment and construction worker vehicles will contain small amounts of NO_x, SO_2, CO, particulate matter, and VOCs resulting from incomplete combustion of fuel. However, because the heavy-duty diesel-powered construction vehicles allow for more complete combustion and use less volatile fuels than spark-ignited engines, these emissions are relatively low. In addition, the quantity and duration of construction vehicle usage will be limited, resulting in insignificant emissions.

Air Quality Control/Mitigation Methods

Fugitive dust emissions from identifiable construction sources will be minimized as appropriate by one or more of the following techniques:

- Contractors will comply with any applicable state or local regulations governing open-bodied trucks used for hauling sand, gravel, or soil between on- and off-site areas. This could include providing covers, moistening the load with water, and washing wheels to reduce dusting.

- Areas disturbed during construction will be seeded as soon as possible to stabilize or restore the soil surface.

- When construction occurs on bare ground, water (possibly together with other wetting agents) will be used as necessary to suppress dust.

- Temporary vehicular surfaces of crushed rock may be used in high traffic areas. Areas not subject to heavy traffic or continual disturbance will be wetted to suppress dust using nontoxic substances.

- On-site concrete batch plants (if needed) will be equipped with dust control systems which will effectively mitigate off-site impacts.

5.1.2.2 Operational Impacts

Section 176 of the Clean Air Act indicates that Federal agencies must ensure that proposed actions will not cause or contribute to any violation of any AAQS. This section is intended to provide the information necessary to make that determination.

Operation of the proposed facility at ALC will result in minor air quality impacts due to emissions of pollutants from vents and stacks associated with the heating and activities of the new laboratory facilities. Since no additional personnel are expected to be employed at ALC, the ARL realignment at ALC will not affect emissions from vehicular traffic. There may be some changes in traffic patterns at ALC resulting from construction of an on-site parking structure and/or traffic restrictions imposed in the Washington, D.C. metropolitan area due to the Clean Air Act Amendments of 1990; however, the overall air quality effects from these changes will be insignificant.

Estimates of stack emissions were made based upon a projected future increase in fuel usage to provide a block heating load of 14,345,000 BTU per hour for the new facilities (U.S. Army Corps of Engineers, 1992). Using a typical heating value of 1050 BTU/ft^3 for natural gas (U.S. Environmental Protection Agency, 1985) and 136,000 BTU/gal for No. 2 fuel oil (U.S. Environmental Protection Agency, 1973), 13,662 ft^3 per hour of additional natural gas or 105 gallons per hour of No. 2 fuel oil will be required. Estimates of anticipated increased emissions from these quantities of fuel were derived from EPA guidelines (U.S. Environmental Protection Agency, 1985), as shown in Table 5-1. Since natural gas will be the primary source of heating, emissions will be minimal.

TABLE 5-1
ESTIMATED EMISSIONS FROM INCREASED FUEL USAGE AT ALC

Pollutant	Natural Gas	No. 2 Fuel Oil
	Lbs/hr	Lbs/hr
Particulate Matter	.07	.21
Sulfur Dioxide	.01	.54 (@.3% S fuel)
Carbon Monoxide	.48	.52
Nitrogen Oxides	1.91	2.10
Volatile Organic Compounds	.08	.03

Source: U.S. Environmental Protection Agency, 1973, 1985 and U.S. Army Corps of Engineers, 1992

Projected increases in ambient concentrations due to increased boiler fuel usage resulting from the proposed action were evaluated using a simple screening model called SCREEN as recommended in the U.S. EPA's Guidance on Air Quality Models (U.S. Environmental Protection Agency, 1986). For the purposes of this analysis, the following "typical" emission parameters were assumed:

Building Dimensions: 220 ft x 220 ft x 30 ft high
Stack Height: 10 ft above roof height
Stack Location: Centered on roof
Stack Diameter: 3 ft
Exit Velocity: 60 ft/sec
Exit Temperature: 300°F

The results of the SCREEN modeling analysis using the higher fuel oil emission rates are summarized in Table 5-2 (see also Appendix A). The maximum predicted one-hour average concentration increases at a distance of 100 meters from the stack (which will be onsite) are generally very small compared with the applicable AAQS for any averaging period. The NO_x concentration increases will be much smaller on an annual average basis because fuel oil is a standby fuel and emissions will not persist at the hourly rate throughout the year.

As indicated in Section 4.2, ALC is located in an area which is designated as nonattainment for carbon monoxide and ozone. This designation generally leads to stringent permitting requirements for major new sources. However, the increases in fuel usage projected and the resulting increases in pollutant emissions are too small to be of concern in considering nonattainment requirements (personal communication, Craig Holderfer, Maryland Department of the Environment, 13 May 1992).

TABLE 5-2
MAXIMUM IMPACTS FROM ADDITIONAL FUEL USAGE
AT ARL BOILERS LOCATED AT ALC

Pollutant	Maximum Concentration ($\mu g/m^3$)
Particulate Matter	2.8
Sulfur Dioxide	7.1
Carbon Monoxide	6.8
Nitrogen Oxides	27.6
Volatile Organic Compounds	.4
Concentrations are maximum 1-hour values at 100 meters from stack	
Source: Ebasco Environmental, 1992.	

Additional fuel oil storage facilities would be required for the ARL facilities if new High Temperature, Hot Water (HTHW) boilers are constructed instead of adding boiler capacity to the present central H/C Plant. This would result in a slight increase in VOC emissions due to volatilization losses from the storage tank. Emissions would be insignificant because the tank would probably be small and No. 2 fuel oil has a relatively low vapor pressure.

Estimates of potential emissions from laboratory vent hoods are best assessed based upon present operations at ETDL in Fort Monmouth, New Jersey, as it is anticipated that this group will continue to undertake similar research after transferring to ALC. The ETDL facility presently operates 140 fume hoods, served by three scrubbers and three air and mist eliminators, which are to be converted to scrubbers. The scrubbers at this facility have not been permitted because the State of New Jersey does not require scrubbers to be permitted. (Appendix B lists chemicals presently in use at ETDL.)

Laboratory hoods are most commonly used to exhaust vapors from: small quantities of liquids (a few ounces or less) during curing, touch up painting, or cleaning procedures; gases released from research equipment small enough to fit in a hood; vapors released from bottles of chemicals maintained in hoods for storage and transfer procedures; and room air from laboratories. None of the hoods would normally exhaust more than an ounce or two of toxic/hazardous chemicals during a normal work day.

In an attempt to quantify laboratory hood vent emissions and their potential ambient impacts, an annual bulk chemical usage inventory was obtained from the ETDL facility. Approximate emission estimates were then made by assuming that all of the volatile chemicals used would be 100 percent volatilized and vented. This assumption results in extremely conservative annual emission estimates that do not take into consideration the volume of chemicals that would be disposed of, reacted or recycled in liquid form. Most hood vents are also served by scrubbers and no consideration has been taken of potential removal of pollutants by the scrubbers since

efficiency is not known. Table 5-3 provides a "representative" listing of emission estimates for volatile chemicals in use at ETDL which are also contained in the State of Maryland Air Quality Regulations (COMAR 26.11.15) Toxic Air Pollutant (TAP) listings.

For each chemical listed in Table 5-3 a screening level concentration in ug/m^3 is also provided. This concentration is also derived from procedures indicated in the Maryland Regulations and is considered to be the level below which emissions "do not unreasonably endanger human health". Once this screening level concentration is determined, the Regulations also provide a "most stringent" mass emission rate (dependent on screening level concentration range) which can also be used to determine that emissions will "not unreasonably endanger human health". These emission rates are also shown in Table 5-3 and all compounds listed have estimated emissions below the indicated risk-based COMAR levels.

To further evaluate the significance of the estimated ALC fume hood vent emissions, maximum one-hour average concentrations were estimated using EPA's SCREEN model. The following emission parameters were assumed for hood vent releases:

Building Dimensions: 220 ft x 220 ft x 30 ft high
Stack Height: 5 ft above roof height
Stack Location: Centered on roof
Stack Diameter: 3 ft
Exit Velocity: 0 ft/sec
Exit Temperature: 70°F

The maximum one-hour average concentrations determined for each pollutant are summarized in Table 5-3. For pollutants identified in the Maryland list of air toxics, the estimated maximum one-hour average concentrations are also below the State screening levels.

In summary, the estimated emissions for the proposed ALC facilities due to fuel combustion in boilers for space heating and fume hood vents were evaluated with respect to applicable standards and guidelines. Estimated emissions and resulting ambient concentrations will be small and are expected to be of no consequence with respect to the air quality in the vicinity of the alternative site plans or in the ALC region. It is not expected that these emissions will cause or contribute to any new violations of the AAQS nor have significant impact on the existing ozone or CO nonattainment areas.

5.1.3 Water Resources

5.1.3.1 Surface Water Hydrology and Water Quality

Surface water impacts are expected to be minor during both construction and operation of the ARL facilities. However, a small potential for contamination of Paint Branch Creek exists from uncontrolled surface runoff caused by an accidental spill of chemicals during construction and operation.

TABLE 5-3
ESTIMATED EMISSIONS FROM FUME HOOD VENTS

Chemical [1]	Amount Used (gal/yr)	Emissions [2] (lbs/hr)	COMAR Most Stringent EM Rate (lbs/hr)	Model-Projected [3] Max. Conc. (ug/m^3)	COMAR Screening Level (ug/m^3)
Acetone	124.9	.094	.89	19.5	18000.
Hydrochloric Acid	23.6	.023	.21	4.8	70.0
Hydroflouric Acid	12.8	.012	.04	2.5	24.9
Methanol	36.9	.028	.89	5.8	2600.
Nitric Acid	13.7	.020	.10	4.2	50.
Isopropyl Alcohol	24.4	.018	.89	3.7	9800.
Sulfuric Acid[4]	4.6	.008	.04	1.7	10.
Chlorine	----	.00125	.04	.3	15.
Chloroform	.7	.001	.21	.2	98.
Phosphine	----	.00069	.003	.1	4.
Benzene	5.4	.0045	.89	.9	324.
Toluene	4.1	.003	.89	.6	3750.
Trichloroethylene	1.8	.0025	.89	.5	2700.
Bromine	1.0	.0028	.003	.6	7.
Methyl Ethyl Ketone	2.5	.002	.89	.4	5900.
Methyl IsoButyl Ketone	2.0	.0015	.89	.3	2050.
Methylene Chloride	4.0	.003	.89	.6	17620.
Xylene	5.1	.003	.89	.7	4350.
Chlorobenzene	.5	.0005	.89	.1	3500.
Dichloroethane	.5	.0005	.89	.1	4000.
Hydroquinone	2.5	.003	.07	.7	20.
Acetonitrile	.5	.0007	.89	.1	700.
Carbon Tetrachloride	5.6	.0085	.36	1.8	126.

TABLE 5-3 (Cont'd)
ESTIMATED EMISSIONS FROM FUME HOOD VENTS

Chemical [1]	Amount Used (gal/yr)	Emissions [2] (lbs/hr)	COMAR Most Stringent EM Rate (lbs/hr)	Model-Projected [3] Max. Conc. (ug/m^3)	COMAR Screening Level (ug/m^3)
Phosphorus Oxychloride	.2	.0003	.003	.07	6.
Carbon Disulfide	.8	.001	.36	.2	120.
Pyridine	.8	.0007	.46	.1	150.
2 Methoxyethanol	.1	.00009	.89	.02	800.
Phosphoric Acid	12.1	.021	.04	4.4	10.
Ethylene Glycol	5.6	.006	.89	1.2	1250.
Dioxane	.3	.0003	.89	.1	900.

Notes: [1] For chemicals likely to volatilize at room temperature, the assumption was made (conservatively) that all usage resulted in emission through a fume hood vent. Chemicals with vapor pressure below 10 mm Hg were generally not included in the listing since they are not likely to volatilize at room temperature.

[2] Where density data were not available, a common value of 6.66 lb/gal was used.

[3] Concentrations are maximum 1-hour average values at 100 meters from stack.

[4] Approximately 45 gal/yr of sulfuric acid is recycled as liquid hazardous waste.

Construction Impacts

The potential for adverse effects to Paint Branch Creek caused by erosion from areas disturbed by construction activities will be minimized by implementing erosion and sediment control and stormwater management measures (ESC-SWM) under any of the site plans. ALC will comply with the CE requirements for stormwater management, which are at least as stringent as the Maryland stormwater regulations (COMAR, Title 26, Subtitle 09, Chapter 02 - Stormwater Management). The areas of erosion at the north end of the North Parking Lot will be repaired prior to or during construction.

Pursuant to the new NPDES regulations, any construction-related activity which disturbs more than 5 acres of land is required to obtain a NPDES permit for stormwater discharges. Since Site Plans Nos. 1, 3, 4, and 5 would disturb more than 5 acres of land, a NPDES permit is required.

During the construction phase, the possibility exists for minor spills of fuel, solvents, or other construction-related fluids. ALC will modify the existing SPCC Plan and ISCP to preclude

and/or mitigate possible releases of hazardous and/or non-hazardous material during construction.

Operational Impacts

Construction of ARL facilities will have a negligible impact on the discharge of Paint Branch Creek. The area to be disturbed for any site plan (approximately five acres) represents only a small fraction of the several thousand acre-drainage area of Paint Branch Creek. Further, the North and South Parking Lots represent most of the area to be disturbed. These impervious areas will remain impervious after construction of the ARL facilities and therefore the contribution of stormwater runoff from these surfaces to Paint Branch Creek will not change. Under Site Plan Nos. 3 and 4 (the 400 Area alternatives), stormwater runoff would increase slightly due to the conversion of the wooded 400 Area to a developed, less pervious land surface.

Maryland stormwater management regulations require a stormwater management plan to ensure that "the post-development peak discharges for a 2- and 10-year frequency storm (24-hour duration) event be maintained at a level equal to or less than the respective 2- and 10-year pre-development peak discharge rates, through stormwater management measures that control the volume, timing and rate of runoff." The stormwater management plan should incorporate best management practices according to the following order of performance: (1) infiltration of runoff on site; (2) flow attenuation by use of open vegetated swales and natural depressions; (3) stormwater retention structures; and (4) stormwater detention structures. ALC will develop and implement a stormwater management plan for the ARL facilities consistent with Maryland stormwater management regulations.

Because the number of personnel and hence vehicles at ALC will remain about the same, there should be no increase in oils and grease in runoff from the parking facilities. For Site Plan Nos. 2, 3 and 4 there could be a minor increase in runoff water temperature and pollutant loadings from those areas that would be developed and not currently used for parking. These increases would not adversely affect Paint Branch Creek.

The risk of accidental spills will be minimized by complying with the existing SPCC Plan and ISCP, which will be modified to address additional spill potentials and mitigation specific to the new ARL and facilities at ALC.

Under Site Plan Nos. 3 and 4 (the 400 Area alternatives), increased storage of fluids (e.g., fuel oil for a new boiler, duplication of material storage for separate areas) may require added precautions because of the new material storage location. Under Site Plan Nos. 1, 2, and 5 (North Parking Lot Single and Multiple Buildings, and 200 Area Laboratory Renovation), additional precautions may not be required since materials could be stored in or near existing storage areas.

5.1.3.2 Groundwater

On-site groundwater elevation data (most are from the area near the 100 series buildings), indicate that depth of groundwater ranges from eight to twenty feet. Construction of foundations for a parking deck in the South Parking Lot and/or the expansion of the heating and cooling

plant may require dewatering during the excavation. Sheet piling or well points could be used to reduce the amount of groundwater which enters the excavation. Water pumped from the excavation will either be discharged on the grounds of ALC, to the sanitary sewer, or transported offsite for disposal, depending upon regulatory approval.

Based on foundation borings, depth of groundwater in the higher elevations of the site (near the 200 series buildings) was more than 50 feet. Since most of the higher elevations act as recharge areas, there should be no significant construction impacts on groundwater for Site Plan Nos. 3, 4, or 5 (the 400 Area alternatives or the 200 Area alternative). However, saturated conditions may occur in local clay pockets after a heavy rain. If necessary, the dewatering options mentioned above would be employed for these site plans.

Implementation of any of the site plans should not affect the groundwater.

5.1.4 Geology, Soils and Topography

5.1.4.1 Geology

No significant subsurface activities are planned; therefore, construction and operation of the new facilities under any of the site plans should not have any significant effect on the geology at ALC. Sheet piling for dewatering purposes, if needed, should not require special installation procedures. Pile foundations should not be required for the proposed facilities for any of the site plans. Project construction will not affect any economically important geologic resources.

5.1.4.2 Soils

The proposed facilities will be constructed within either the Sassafras series (North and South Parking Lots) or the Manor series (400 Area) depending on the site plan selected. Neither of the two classes of soils would limit construction activities. The Sassafras soils are well-drained with high permeability. The Manor soils are also well drained with moderate permeability.

During construction, an erosion and sedimentation control plan and a stormwater management plan will be implemented. Since most of the construction will be situated on plateaus adjacent to steep slopes, erosion control measures will be necessary to preclude sediment transport to Paint Branch Creek.

Erosion potential is greatest at the 400 Area, the North Parking Lot and west of the North Parking Lot because these areas are near the steep slopes (greater than 20%) adjacent to Paint Branch Creek and its tributary. The 400 Area is approximately 300 feet from Paint Branch Creek at its closest point. The North Parking Lot is situated approximately 150 feet from the tributary and 200 feet from Paint Branch Creek at its closest point. The area west of the North Parking Lot (Site Plan No. 2 - Wastewater pretreatment plant) is also approximately 150 feet from the tributary. Construction and operation in either of these areas may require additional slope stability measures to minimize erosion.

5.1.4.3 Topography

None of the site plans is expected to have any significant effects on topography. Buildings will be sited to minimize grading and designed to complement existing topography.

5.1.5 Infrastructure

5.1.5.1 Potable Water Supply

Construction Impacts

There will be no adverse effects on potable water supply during construction.

Operational Impacts

Effects on the potable water supply from the proposed realignment would be the same for all site plans. The ARL realignment of personnel and laboratory operations at ALC will result in an annual requirement of 77,300,000 gallons of potable water (conservatively estimated, based on the net increase of laboratory space), or 40 percent more than the current usage (U.S. Army Corps of Engineers, 1992). To accommodate the increased water requirement, a new 10-inch service connection with metering, valving, and appurtenances connected to an existing WSSC 12-inch diameter line along Powder Mill Road (adjacent to the 20-inch main) is recommended. This would provide sufficient capacity for the operation of the new facilities (U.S. Army Corps of Engineers, 1992) for Site Plan Nos. 1, 2 and 5. For Site Plan Nos. 3 and 4, either the existing 8-inch line or a new 10-inch service connection to the 10-inch line along Floral Drive could be made. Since WSSC currently has a capacity of several hundred million gallons per day of potable water, the impact to the WSSC system and the surrounding area from the additional requirement for about 300,000 gallons per day will be about 0.1 percent of supply capacity. This is considered insignificant. Also, during a 100-year drought, the WSSC will be able to supply the same volume of potable water.

The ARL facilities will be designed to ensure that fire protection water pressure requirements will be met.

5.1.5.2 Wastewater Treatment

Construction Impacts

There will be no adverse effects on waste treatment activities during construction.

Operational Impacts

With all site plans, no adverse effects on wastewater treatment and/or discharge are anticipated.

The ARL realignment at ALC will not change the quantity of domestic sanitary sewage effluent since the number of personnel on site at ALC will remain about the same. Industrial discharges, however, will increase due to an increase in laboratory and research-related (e.g.,

microelectronics lab and clean room) operations. A utilities study conducted for ARL at ALC (using sewage flow estimating techniques described in Army technical manual TM 5-814-1), projected that the total discharge after the realignment will be 682,741 gallons per day (U.S. Army Corps of Engineers, 1992). Although this conservative estimate is nearly three times the current discharge level, the capacity of the existing sewer line, rated at 4.6 million gallons per day, is adequate to take this flow. The WSSC treatment facilities have a total capacity of approximately 150 million gallons per day and have excess available capacity of about 15 million gallons per day. The proposed increase in sewage discharge will not exceed the capacity of the treatment plant or cause system breakdown; therefore, the impact will be minimal.

The ARL realignment of laboratory and research operations will include provisions for pretreatment of industrial wastewater prior to discharge into the sanitary sewer system. Wastewater will originate from laboratory floor drains and sinks, plating bath drains, and sources within the clean room. As discussed in Section 4.5.2, ALC presently has two pretreatment facilities in operation. The ARL realignment will include an additional pretreatment facility dedicated to treating the discharge associated with the incoming ARL operations.

Wastewater generated as a result of the realignment to ALC will contain varying concentrations of contaminants similar to those presently found in ALC's industrial wastewater stream (such as heavy metals and inorganics, acids, and bases). The type of pretreatment will therefore be similar and will include:

- Equalization - to minimize or control fluctuations in wastewater characteristics;
- Neutralization - to adjust acidic or alkaline waste streams to neutral pH levels (usually between 6.5 to 8.5 for pretreatment);
- Precipitation and recovery processes - to remove soluble metal and inorganics as well as to recover metals for further use.

The discharge authorization with WSSC will be amended to include the additional pretreatment plant, which will be designed so that no appreciable change will be experienced in the quality of ALC sanitary discharge. Monitoring for compliance with effluent limitations will continue.

For Site Plan Nos. 1, 2, and 5 all wastewater generated from the new ARL facilities would be discharged to the wastewater pretreatment plant prior to discharge to the WSSC system. For Site Plan Nos. 3 and 4, wastewater generated by the clean room would be discharged to the new wastewater pretreatment plant and then to a WSSC sewer line on the north side of Paint Branch Creek. Wastewater generated by the R&T laboratory facilities and renovated laboratory areas would be discharged to one of the existing pretreatment facilities, which would be modified to accommodate the new waste stream. After treatment, the effluent would then be discharged to the WSSC system.

5.1.5.3 Solid Waste

Construction Impacts

Solid wastes typically generated during building construction include construction debris (wood, brick, concrete, etc.) and municipal waste (paper, plastic, food waste, etc.) The construction debris will be disposed off-site at a rubble landfill (as classified by the State of Maryland). Additional collection vessels (dumpsters) will be needed for municipal waste generated during construction. This waste will be collected by the ALC solid waste collection subcontractor during normal operations. The waste flow from the construction and ALC activities will represent an increase relative to existing waste volumes, but the increase should not pose disposal problems.

Operational Impacts

Since there is no net gain in personnel at ALC after all transfers have taken place, the amount of non-residential solid waste currently generated should not increase. The volume of solid waste generated from ARL laboratory operations would be considered a hazardous waste and is included in the hazardous waste total. The volume of solid waste generated from administrative operations and laboratory operations should be almost the same as before implementation. Therefore, a net increase in solid waste is not anticipated.

5.1.5.4 Transportation

Construction Impacts

During the peak construction phase at ALC, approximately 120 construction workers will be employed. The traffic survey conducted at the main gate in January, 1992, indicated a vehicle occupancy rate of 1.2 persons per vehicle. Assuming the same vehicle occupancy rate for the construction worker traffic, an estimated increase of 100 vehicles will enter and leave the site on a daily basis. This increase in traffic will have minimal effect on the surrounding transportation systems, but to further minimize the minor disruption, the shift time of construction workers and delivery times for construction materials will be coordinated to avoid the peak morning and afternoon traffic hours, as well as to prevent delays with employee traffic entering and leaving the site.

The major transportation impact during construction will be the loss of surface parking in the North or South Parking Lots to accommodate building construction, construction worker traffic, and material laydown areas. To minimize the impact on parking, the parking structure will be constructed first in either the North or South Parking Lots (Site Plan Nos. 2, 3, 4, and 5) or both (Site Plan No. 1). During construction of the parking structure, insufficient parking facilities will be available to accommodate all employees; therefore, employee parking may need to be provided at an off-site area with shuttle bus service to ALC. Parking requirements could be reduced by promoting car and van pooling, but this measure will not eliminate the need for parking spaces during construction of the parking structure which could require about a year to complete.

Based on the January, 1992 traffic count conducted at the site entrance and exit, 600 person movements occur during the morning peak hours, and 550 in the evening peak hours. Up to six cutaway vans or three full size buses could be required for shuttle service during the peak demand times, decreasing to one full size bus or two cutaway vans to serve off-peak times (assuming a ten minute cycle time per vehicle). Any required off-site parking and shuttle service will be in place before construction begins, and service will be coordinated with the construction schedule to minimize overlap.

Operational Impacts

Since there will be no significant change in the employment numbers at ALC, there will be no change in traffic conditions in the area during facility operation.

The parking deck sizing and layout design, including entrance and exit flows, internal flows, orientation to the internal road system, and operational details, will reflect an analysis of current arrival patterns and supply/demand relationships. The requirements imposed by local officials in response to the 1990 Clean Air Act Amendments will be a factor in determining the garage size and operation when these regulations are finalized.

5.1.5.5 Energy

This subsection summarizes conclusions and recommendations extracted from the utility study performed by the CE for ALC (U.S. Army Corps of Engineers, 1992). This study was conducted to determine utility impacts from the proposed construction in the North Parking Lot, the H/C plant, and vertical expansion of Buildings 202 and 204. The utility study did not address construction in the South Parking Lot, but utility impacts for construction of a parking deck in the South Parking Lot are assumed to be insignificant and limited to electricity for lighting. Since the utility study also did not address Site Plan Nos. 3 and 4, utility impacts for these site plans are conceptual.

Electrical Power

The existing electrical utility service from PEPCO and the substation transformer will have adequate capacity to serve the projected laboratory loads and maintain the proper level of power reliability and redundancy. The basic system of underground ductbanks and 13.8 kV feeders is adequate to serve the laboratory modifications, additions, or new construction. The following electrical distribution refinements are recommended:

1. Extend an additional 13.8 kV feeder from the existing substation to the H/C plant, Building 106.

2. Reconnect certain 13.8 kV feeders to provide load balance and maximum redundancy consistent with reliable power distribution in the facility.

For Site Plan Nos. 3 and 4, the electrical demand from the clean room and the wastewater treatment facility may require more electricity than is presently available from existing transformers in the area. Since the utility study did not investigate available electrical loading

at the 400 Area, a detailed evaluation of the existing load would be necessary. The installation of additional electrical lines along Floral Drive and Kuester Road may be necessary which would require crossing Paint Branch Creek and possible environmental impacts.

Natural Gas

ALC has natural gas distribution and service to the H/C plant, Building 106. There is no natural gas distribution service throughout the rest of the facility. If the heating requirements can be met by distribution of heating water from the central plant, no modifications to this utility are necessary. The LP gas distribution system could be extended to the new laboratories for general laboratory use, or gas could be supplied via bottled gas service.

For Site Plan Nos. 3 and 4, extension of the existing natural gas lines to the 400 Area may not be cost effective. On the side of Paint Branch Creek where the 400 Area site plans are located, the nearest natural gas distribution service is more than a half mile away. It may be possible to convert the abandoned LP gas line for natural gas distribution, and extend it to the 400 Area. Conversion of the LP gas line would require cathodic protection and additional installation costs, including the connection with the natural gas line in Building 106.

Fuel Oil

If heating requirements for ARL facilities are provided by natural gas-fired boilers (either through expansion of the H/C plant or addition of internal gas-fired boilers at the new facilities), fuel oil will not be needed for heat generation. However, fuel oil will be required for backup to the new boilers or expanded H/C facilities. For each option, additional UST(s) would be installed near the boilers to accommodate fuel oil storage.

Steam/HTHW

Two options were considered for providing the heating water (steam). Option 1 would add boiler capacity to the existing H/C plant. Option 2 would add two 10,000,000 BTU per hour HTHW boilers within the proposed laboratory facility. This second option would require the extension of the natural gas piping to the new facility and a provision to provide a stand-by source of heat, either with the addition of fuel oil storage or a connection to the existing heating water distribution system.

Option 1 is recommended since the addition of heating equipment to the H/C plant would consolidate the heating capacity in one location and maintain the desired efficiency.

5.1.6 Training Areas

The new ARL facilities at ALC will not affect training areas, since there are no training areas at ALC.

5.1.7 Hazardous and Toxic Materials

5.1.7.1 Hazardous Materials Storage and Handling

Construction Impacts

The potential impact due to the use of hazardous materials during construction activities is the same for all site plans.

Construction activities could result in the possible release of various chemicals, which come in a variety of forms including dusts, vapors, fumes, liquids, gases, and pastes. Many of these chemicals (cleaning and degreasing solvents, putties, coatings, and acids) are classified as hazardous materials.

A spill or release of hazardous materials during the four-year construction period could potentially cause minor contamination of Paint Branch Creek through runoff and/or soil contamination. To minimize the potential for accidental releases of hazardous materials, provisions will be made for proper handling and storage of hazardous materials, and spill prevention and cleanup measures. Spill contingency plans tailored for construction activities will be developed and made available to all construction workers for their review and understanding. The spill contingency plans will include information on locations of hazardous chemicals, proper spill response, emergency contacts, and containment provisions.

Operational Impacts

The operational impacts involving hazardous material storage and handling resulting from the relocation of ARL facilities to ALC will be minimal. Of all the facilities proposed for relocation, ETDL from Fort Monmouth, New Jersey, has the largest projected usage rate and storage requirement for hazardous chemicals. A recent chemical inventory list for ETDL lists slightly over 300 different substances (Electronics Technology Devices Laboratory, 1992). Many of the same chemicals used at ETDL are currently stored in the CCCF at ALC. The CCCF has an inventory exceeding 1,100 different compounds, over three times that of ETDL. The hazardous materials are used by ETDL for research activities similar to those presently being conducted at ALC; these include electroplating, printed circuit board fabrication, and laboratory operations involving acids, bases, and solvents. Therefore, no significant changes to hazardous material storage and handling procedures will be required.

ETDL will also use potentially hazardous laboratory instrumentation, including: lasers, high intensity optical devices, and radio frequency and microwave devices (Electronics Technology Devices Laboratory, 1992). Operational impacts involving the use of these instruments will be minimal. No transmitting antennas will be required to accommodate the transferring facilities. All equipment will be operated within laboratory confines by individuals who are thoroughly familiar with them.

5.1.7.2 Hazardous Waste Management

Construction Impacts

Use of hazardous materials during construction will result in the generation of hazardous waste. The hazardous waste management procedures are discussed in Section 4.7.7; impacts are expected to be minimal. Construction waste typically includes one or more of the common hazardous waste groups - ignitable, corrosive, reactive, or toxic. Frequently used acids and bases include sulfuric, hydrochloric, and acetic acids, and sodium hydroxide. Common solvents include: trichloroethylene; perchloroethylene; toluene; 1,1,1-trichloroethane; methylene chloride; and acetone. Ignitable wastes include paint wastes, epoxy resins, adhesives, and spent solvents. Spent solvents are generated by painting, cleaning, degreasing, air conditioning and maintenance, and fluxing. Rags used to clean solvent spills are also considered hazardous waste (Hazmat World, August 1991). Volumes of these hazardous materials will generally be small in comparison to operational wastes currently generated.

A spill or release of hazardous waste during construction could be a potential cause of contamination through runoff and/or soil contamination. As a mitigative measure, provisions will be made for proper handling and storage of hazardous waste and for spill prevention and cleanup. Spill contingency plans tailored for construction activities will be developed and made available to all construction workers for their review and understanding. The spill contingency plans will include information on locations of hazardous waste storage, proper spill response, emergency contacts, and containment provisions.

Operational Impacts

The realignment of ARL to ALC will significantly increase the amount of hazardous waste generation and subsequent storage requirements at ALC. Of the facilities proposed to relocate to ALC, ETDL is the largest waste generator. The most recent data available for ETDL hazardous waste generation for those activities realigning to ALC indicate that approximately 165,000 pounds of hazardous waste were generated during calendar year 1990 (U.S. Army Materiel Command, 1990). Approximately 83,000 pounds of this hazardous waste generated was due to production of lithium batteries, and this program will not be realigned with ARL at ALC. Although the types of hazardous waste generated (discarded chemicals, spent laboratory solvents, waste laboratory solution, and metal-contaminated mixtures) are similar to those generated at ALC, the quantity generated at ETDL is significantly greater than the quantity generated at ALC for a similar time period.

ETDL does not currently treat its industrial and/or laboratory wastewater with any type of pretreatment. Liquid wastes are typically stored in glass containers. The untreated waste stream cannot be discharged into the sanitary sewer and must be stored for off-site treatment and disposal. However, the realignment of ARL at ALC will include construction of an additional pretreatment plant specifically for ETDL-generated wastewater. Pretreatment will significantly reduce the total ETDL hazardous waste stream. Since a pretreatment plant will be built, there will be no appreciable change in the quality of the ALC sanitary sewer discharge.

Any waste that cannot be processed through the pretreatment facility will be stored in the ALC hazardous waste storage building for subsequent disposal. The frequency of disposal shipments from this RCRA storage facility will be changed to ensure that the maximum capacity of the existing storage facility is not exceeded. It is anticipated that the hazardous waste will continue to be transported off-site using the transportation corridors that are currently used.

5.1.8 Plant, Animal, and Aquatic Ecology

Construction and operation of the ARL facilities at ALC will have a minor effect on plant, animal, and aquatic ecology. Impacts will primarily be limited to (1) clearing of a small area of upland forest vegetation, (2) suspended sediment and sedimentation effects on aquatic ecology from erosion of disturbed ground surfaces or unstable areas, and (3) effects on aquatic ecology caused by a minor increase in stormwater runoff and pollutant loading from the increased impervious surface area.

5.1.8.1 Plant Ecology

Construction Impacts

Site Plan Nos. 1 and 5 would not require clearing of natural vegetation. Site Plan No. 2 (North Parking Lot, Multiple Buildings) would require a permanent clearing of less than one acre of grass and sapling trees to the west of the North Parking Lot for the wastewater pretreatment plant. Site Plan Nos. 3 and 4 (400 Area) would result in the permanent loss of approximately two acres of young mixed oak forest vegetation, and some additional clearing for temporary construction needs. The loss of this small area of forest vegetation in the 400 Area would be irreplaceable in a region with diminishing forest resources.

For all site plans, expansion of the H/C plant will result in the permanent loss of a small landscaped area adjacent to the existing plant. The proposed phased construction will preclude the need for temporary clearing for construction laydown areas.

Operational Impacts

Impacts to plant ecology during project operation would be the permanent loss of vegetation as described above.

5.1.8.2 Animal Ecology

Construction Impacts

The principle project-related impact on wildlife will be the loss of habitat for forest dwelling species such as deer, squirrels, and numerous birds. During the four-year construction period, wildlife in adjacent natural areas will be disturbed by the increased noise and activity. Site Plan Nos. 3 and 4 (400 Area) would have the greatest effect on wildlife because they require the greatest amount of land clearing. Site Plan No. 2 (North Parking Lot, Multiple Buildings), would have a minor effect due to the clearing of one acre of grass and sapling trees for the wastewater treatment plant.

Operational Impacts

Impacts to animal ecology during project operation will primarily be the permanent loss of habitat from the areas cleared for construction as described above. Additionally, wildlife in adjacent wooded areas may experience some disturbance from noise and activity at the new ARL facilities (e.g., from landscape maintenance). This effect would be greatest under Site Plan Nos. 3 and 4 (400 Area) due to the presently undeveloped character of the 400 Area.

5.1.8.3 Aquatic Ecology

Construction Impacts

The proposed project will not require any construction within aquatic systems; however, short-term minor effects on the Paint Branch ecosystem will occur because of increased suspended sediment concentrations and sedimentation due to erosion from disturbed areas. High suspended sediment concentrations and sedimentation could adversely affect the adult brown trout and macro-invertebrates in Paint Branch Creek by directly affecting individuals (e.g., clogging gills leading to suffocation) and reducing habitat, especially in pools. Through implementation of the erosion and sedimentation control measures described in Section 5.1.3.1, the short-term suspended sediment concentration increases during storm events will be substantially below those concentrations at which brown trout are affected. Concentrations would have to be greater than 1,000 mg/l for several days to cause fish mortality (National Academy of Sciences and National Academy of Engineering, 1973). Further, given the size of the Paint Branch Creek watershed above ALC (greater than 10 square miles), any local suspended sediment concentration increases will be diluted by the flow in Paint Branch Creek.

Operational Impacts

The proposed project will not discharge any wastewaters to Paint Branch Creek. As described under Section 5.1.3.1, the risk of accidental material spills will be reduced by modifying the existing ALC SPCC Plan and ISCP to accommodate the ARL facilities. None of the alternative site plans will be within the Protected Stream Clearance Buffer at ALC.

The Paint Branch ecosystem will experience minor long-term effects from contaminant loading and increased water temperatures due to stormwater runoff from the new ARL facilities. As described in Section 5.1.3.1, these effects will be minimized by the proposed stormwater management facilities.

5.1.8.4 Threatened and Endangered Species

None of the site plans will affect threatened or endangered species. In accordance with the Endangered Species Act and the Fish and Wildlife Coordination Act, information and comments were requested from the FWS and NHP on Federal and state threatened and endangered species, and species of special concern occurring within the proposed project vicinity. The FWS and NHP state that there are no listed Federal or state threatened or endangered species at ALC (letter from J. Wolfin of U.S. Fish and Wildlife Service, 7 May 1992; letter from J. McKegg, Director of Maryland Natural Heritage Program, 3 April 1992) (Appendix C).

5.1.9 Cultural Resources

5.1.9.1 Archeological Resources

Compliance with Sections 106 and 110 of the NHPA will result in no anticipated adverse impacts to significant cultural resources for any of the site plans. The following section discusses potential construction and operational impacts to archeological and architectural resources. The Army's strategy to meet Section 106 and 110 compliance requirements also follows.

Construction Impacts

Subsurface disturbance resulting from construction activities could affect potentially extant archeological remains in the project area. The Phase I archeological investigations conducted in June 1992 indicated that there are potentially significant cultural resources in the 400 area that could be affected by project construction.

Site Plan Nos. 1 and 5 were not evaluated in the Phase I investigations. These sites lie entirely within disturbed areas (i.e., North Parking Lot, South Parking Lot, and existing buildings). A previous sensitivity analysis indicated that these areas are located in areas exhibiting low potential for containing significant cultural resources. Expansion of the H/C plant located to the west of the South Parking Lot will not involve extensive excavation and thus will not affect archeological resources.

For Site Plan No. 2, preliminary results of the Phase I investigations in the area west of the North Parking Lot indicate that the area has been disturbed in the past and the site integrity compromised so that it would not meet NRHP eligibility criteria. Review of a 1974 photograph of earlier construction activity at the area west of the North Parking Lot indicated that the site had been graded and a steep bank mechanically formed. Shovel testing verified that the one-half acre area had been graded to such an extent that the integrity of recovered cultural material, which contained a mixture of prehistoric and historic artifacts, had been lost.

Site Plan Nos. 3 and 4 (400 Area) have the potential for greatest effect because the Phase I testing identified potentially significant cultural resources throughout the area. The 400 Area is one of the least disturbed areas of ALC. Should Site Plan Nos. 3 or 4 be given further consideration, a Phase II survey would be undertaken in accordance with Section 110 of the NHPA as part of the proposed ARL realignment at ALC. Nonetheless, the Army plans to perform a Phase II survey in accordance with the requirements of the NHPA in the 400 Area at a later date as part of the Cultural Resources Management program at ALC.

The Army will ensure compliance with the NHPA through implementation of the strategy contained in the Programmatic Agreement. If a site is eligible for NRHP listing, appropriate mitigative measures will be undertaken prior to, or during construction.

Operational Impacts

There will be no operational impacts on archeological resources for any of the site plans.

5.1.9.2 Architectural Resources

There will be no construction or operational impacts on significant architectural resources located at ALC or in its immediate vicinity under any construction alternative.

5.1.9.3 NHPA Compliance

If any outstanding Section 106 or Section 110(f) actions remain after the completion of this EA, the Army will stipulate in the Finding of No Significant Impact (FNSI) or the EIS the specific areas of non-compliance. The FNSI or EIS will further specify that ARL-related construction activities at ALC will not be undertaken until the actions necessary to inventory, assess, and take into account effects on potentially significant properties have been completed.

5.1.10 Sociological Environment

5.1.10.1 Demographics

Implementation of the proposed action will negligibly affect the demographic makeup of Montgomery and Prince George's Counties. With a combined population of nearly 1.5 million, the net change resulting from a shift in operations at ALC of approximately 35 positions is proportionally nominal. Impacts, however negligible, could occur in the following ways:

Attraction of New Population During the Construction Phase of the Proposed Project. Construction of the proposed facilities at ALC has the potential to attract workers to the project area. However, the population increases likely to occur during the construction period will be dependent on the number of construction jobs created and the inability of the local labor market to fill those jobs. Since the region has a large, skilled labor population, few construction workers, if any, would relocate to Montgomery or Prince George's Counties for the duration of the construction project. Those workers who do transfer into the area would most likely do so on a temporary basis, only for the duration of construction.

Attraction of Staff and Dependents as a Result of the ARL Realignment at ALC. Implementation of the proposed action is expected to result in a net decrease of approximately 35 ARL positions at ALC. Due to the size of the two counties, this net loss at ALC in a region of over 1.5 million is negligible.

Induced Population Effects. Population increases resulting from construction expenditures and construction personnel expenditures will be small, short-term, and limited to the construction period. In the long-term, due to the size of the combined labor force of the two counties (estimated to exceed 800,000), population/demographic changes caused by ALC and employee expenditure changes will be negligible.

5.1.10.2 Aesthetic Values

Effects on the aesthetic value of ALC during construction will not be visible to the public. ALC employees will find a marked decrease in aesthetics during the four-year construction period due to the presence of construction equipment and activity in normally serene and scenic natural surroundings, particularly if construction occurs at Site Plan Nos. 3 and 4 (400 Area). NRTC will experience minor adverse aesthetic impacts during construction of the H/C plant expansion and if the South Parking Lot is used for the parking structure (i.e., Site Plan Nos. 1, 2, 4, and 5).

Aesthetic value during operation will decrease moderately for ALC employees. The ALC complex will be more concentrated and built up with parking decks and additional buildings. Site Plan No. 5 (200 Area Laboratory Renovation) would experience the least visual and aesthetic effects, followed by Site Plan No. 3 (400 Area, North Parking Deck). Site Plan No. 4 (400 Area, South Parking Deck) would have the greatest aesthetic impact because of the number of areas which would be changed and built up. The parking structure in the South Parking Lot (Site Plan Nos. 1, 2, 4, and 5) would have a minor adverse impact on the view from NRTC as this structure would replace the existing parking lot.

5.1.10.3 Noise

Noise effects were assessed for both construction and operation of the ARL realignment at ALC. The assessments were made for the nearest noise-sensitive receptors to ALC, which are residences in the Hillandale community, adjacent to the east and west boundaries and across Powder Mill Road to the south. There are no nearby sensitive receptors to the north because NSWC adjoins the north boundary. The construction noise assessment was made utilizing the acoustic center concept because of the mobility of construction equipment. The acoustic center of construction activities at the North and South Parking Lots (i.e., 200 Area acoustic center) is about 800 feet from the west boundary, 1,000 feet from the south boundary, and 1,200 feet from the east boundary of ALC. For assessment of construction noise for site Plan Nos. 3 and 4 (400 Area), the acoustic center is located 800, 1,800 and 2,400 feet from the south, west and east boundaries, respectively.

Construction Impacts

The existing vegetation around the ALC property line adjacent to residential areas will be maintained because all of the construction will take place in the parking lots or in adjacent cleared areas. Under Site Plan Nos. 1 and 2 (North Parking Lot, Single and Multiple Buildings) and Alternative No. 5 (200 Area Laboratory Renovation), there would be no new land clearing (except where the wastewater pretreatment plant would be located on the west side of the North Parking Lot under Site Plan No. 2). Clearing would be required at the 400 Area for Site Plan Nos. 3 and 4, but significant vegetation buffers would be maintained around the ALC boundaries.

Table 5-4 presents the expected equivalent daytime sound levels at the south, west, and east boundaries adjacent to sensitive receptors during each major construction activity at the North and South Parking Lots (i.e., the 200 Area acoustic center) and 400 Area. These levels were developed by considering the numbers and types of equipment, sound levels produced by the

TABLE 5-4
CONSTRUCTION NOISE LEVELS

Construction Activity	L_{eq} Noise Levels (dBA) at ALC Boundary		
	West	South	East
Subgrade Investigation	64/57[1/]	62/64	60/54
Pavement Demolition/Site Clearing	67/60	65/67	63/57
Grading/Excavation	65/58	63/65	61/55
Underground Utilities	51/44	49/51	47/41
Foundation	60/53	58/60	56/50
Structural Steel	57/50	55/57	53/47
Roof System	54/47	52/54	50/44
Building Exterior	48/41	46/48	44/38
Building Interior	61/54	59/61	57/51
Paving	62/55	60/62	58/52
Landscaping	66/62	64/66	62/56

NOTE: [1/] 200 Area/400 Area Acoustic Center

Source: Ebasco Environmental, 1992.

equipment, typical utilization rates for the equipment, and the distance from the equipment to the boundaries.

Daytime sound levels on the west boundary, which is the closest boundary to the construction sites in the parking lots, would range from between 48 and 67 dBA during the different construction activities for each site plan. The same levels are predicted for the south boundary nearest the 400 Area under Site Plan Nos. 3 and 4 (400 Area). The loudest activities would occur early in the project during pavement demolition and during grading and excavation of the sites when the heaviest construction equipment would be used. These activities have a short duration (about one month). The 400 Area is generally further from the installation boundaries than the other sites; therefore, construction noise levels would be from 0 to 7 dBA less for Site Plan Nos. 3 and 4 than for Site Plan Nos. 1 and 2 (North Parking Lot Single and Multiple Buildings) and Site Plan No. 5 (200 Area Laboratory Renovation).

The State of Maryland has set an allowable limit of 90 dBA during construction, which will not be exceeded at any residence under any site plan. In fact, construction noise will generally be below the 65 dBA daytime limit for normal non-construction related activities. However, should construction continue past 10 p.m., the lower nighttime limit of 55 dBA could easily be exceeded if heavy equipment were used. Therefore, appropriate mitigative measures will be to either

prohibit construction at night, or the use of loud equipment at night. No mitigative measures will be necessary to limit daytime construction noise beyond the use of normal exhaust mufflers and any other manufacturer supplied noise reduction equipment.

ALC staff in existing buildings may occasionally experience minor interruptions of conversation due to construction noise. However, the building walls provide significant noise attenuation and only the loudest activities will be noticeable. Any effects will be minor and of short duration, and would be less under Site Plan Nos. 3 and 4 (400 Area) than under the other site plans. Similarly, personnel at NRTC may experience minor interruptions of conversation if the parking structure is constructed in the South Parking Lot.

Operational Impacts

The types of noise which will be produced by the incoming activities are expected to be similar to those produced by the existing facilities that will be realigned to ALC. Activities at these facilities are conducted inside and no outside noise problems have been identified. Any noisy activities at ALC will be controlled in a manner similar to that which already exists at ALC. All noise-producing tests are currently contained in test chambers which are further contained in buildings. The combination of the two containments reduces exterior noise to acceptable levels. Because there is no outside test firing range at ALC, no outdoor testing utilizing explosive materials will be allowed.

Building ventilation fans and other equipment, particularly in the wastewater pretreatment plant, will be designed so that noise levels do not exceed the State of Maryland noise standards cited above. The combined noise produced by vehicles of facility staff and contractor personnel will be approximately the same as presently exists because the number of staff and contractor personnel at ALC will be about the same.

Mitigation measures for operational noise include appropriate design of test facilities, building HVAC equipment, and the wastewater pretreatment plant to meet the State of Maryland noise standards. For any equipment which may operate at night, such as HVAC equipment and the wastewater pretreatment plant, the appropriate nighttime design limit will be 45 dBA (continuous) at the facility boundaries adjacent to residential areas in order to meet the State's L_{dn} level of 55 dBA.

5.1.10.4 Odors

Increased potential for odor problems may exist. The probable magnitude of such occurrences is unknown but is probably minor, based upon no noted odor complaints at the current ETDL facility.

5.1.10.5 Public Health and Safety

Construction of the ARL facilities at ALC will not result in any adverse effects on the public health and safety or require additional police or fire support within the surrounding communities. The construction activities to be undertaken at ALC are typical of those required

for any large office complex development and measures taken to protect the public (i.e., signs, snow fencing, etc.) will be similar to those used at any large construction site.

Operation of the proposed facilities will entail the handling, storage, and transport of hazardous material. However, these activities are similar to those presently being conducted at the site and, therefore, will not significantly increase the hazard to public health and safety.

The operation of the clean room may require construction of a hazardous material fire station because of the specialized mission of the laboratory. In the event of a hazardous material spill at ALC, laboratories have the initial responsibility to handle the situation. Currently, LABCOM is conducting a risk assessment to assess the appropriate level of response needed for the mission in 1997. If the necessary response is greater than the installation's capability then County emergency response is called in to assist. The presence of a hazardous material fire station would mitigate any potential effects on public health and safety.

5.1.11 Quality of Life

5.1.11.1 Housing

Very few construction workers, if any, will transfer into either Montgomery or Prince George's County for the duration of the construction at ALC. Those who do relocate will probably seek temporary housing, which is adequate in the two-county area to meet their needs.

A preliminary analysis of off-post housing (see Section 4.13.1.2) coupled with salary information of personnel slated for transfer to ALC indicates that housing prices and availability are sufficient to accommodate the needs of incoming personnel.

5.1.11.2 Schools

Since construction workers are not expected to relocate permanently into the area or to bring their families, no effects on the school system are anticipated during construction of the ARL facilities at ALC. Potential effects on educational facilities will be those related to the transfer of staff to ALC upon implementation of the proposed action. Under a worst-case scenario, all new positions at ALC will be filled by individuals who reside outside of the two-county region, and who will relocate into one of the two counties. Under this assumption, the estimated 473 civilian and military personnel will bring along approximately 700 dependents of school age. This net increase in school age children assumes that all personnel whose positions in ALC would be terminated will remain in the area and not choose to relocate.

The integration of approximately 700 additional students over a four year period into the two-county area will be inconsequential because sufficient capacity presently exists in the school systems and the respective Boards of Education have adopted growth policies.

5.1.11.3 Family Support

No effects on off-post family support services are anticipated as a result of construction or operation of the proposed action.

5.1.11.4 Medical

It is anticipated that existing medical facilities off post will provide appropriate medical and emergency care as needed during construction and operation. Existing medical facilities in the two-county area and regional medical emergency services are equipped to handle existing demand. Any potential minor increases in regional population will be manageable and can be supported by existing local and regional medical services.

5.1.11.5 Shops and Services

The presence of any and all privately owned consumer services is a strict function of market demand. Therefore, any effect on any market-supplied services is beyond the mitigative purview of this action. In spite of small changes in salary and material expenditures during the construction and subsequent operation of the proposed action, no substantive changes in demand for goods and services are expected to occur within the two-county area.

5.1.11.6 Recreation

During construction, there will be some disruption to ALC employees who use ALC facilities for picnicking, nature trail strolls, or other lunchtime outdoor walks. During operation, all recreational activities will continue as before construction.

5.1.12 Permits and Installation Agreements

This section presents the effects which the ARL activities will have on the existing permits and installation agreements at ALC. Those current permits (presented in Section 4.8) which need modifications because of the addition of the proposed ARL activities are presented in the following subsections, as well as in Table 5-5. The additional permits/requirements which must be met for each of the realigning ARL activities are also noted below and are included in the table. Information on the specific details of the permit modifications or other requirements will be provided as part of the site design.

5.1.12.1 RCRA Permit Part B

According to 40 CFR 270.4, a RCRA permit needs to be modified if "material and substantial alterations or additions to the permitted facility are made." In the case of the realigning ARL activities, this will include any additional wastes which may require storage at the RCRA facility that are currently not listed on the permit. Based upon a preliminary examination of the waste streams generated by the realigning ARL activities, the list of wastes identified in ALC's RCRA consent agreement is broad enough to accommodate the new waste stream. It is anticipated that ARL activities will use the existing ALC RCRA facility. If a modification to the RCRA consent agreement is warranted, it would need to be approved before ARL's operations could begin.

5.1.12.2 Stream Crossing Permits

To provide electrical service or natural gas lines to the 400 Area (Site Plan Nos. 3 and 4), a stream crossing permit for Paint Branch Creek may be required by the Maryland Water

TABLE 5-5
PERMITS REQUIRED FOR ARMY RESEARCH LABORATORY
ADELPHI LABORATORY CENTER, MARYLAND

Medium	C/O[1/]	Permits Required	Comments
Water	C	NPDES Permit	Only applicable to Site Plan Nos. 1, 3, 4, and 5 for stormwater. Construction projects disturbing 5 or more acres of land require a permit.
	O	NPDES	Not applicable
	C/O	WSSC (Industrial Discharge)	
	C	Waterway Crossing Permit from State of Maryland Water Resources Administration for electrical line crossing under Site Plan Nos. 3 and 4	May be required pending further study
Waste	C/O	Solid Waste Disposal Permits	
Hazardous Waste	O	RCRA part B	If required, modification approval needed before operations begin
Aboveground/ Underground Storage Tanks	C/O	None	State registration required if any tanks installed

Note: [1/] C/O: Construction/operation activities

Resources Administration. These permits would include conditions to minimize environmental impacts (e.g., sedimentation due to construction).

5.1.12.3 Radioactive Materials

The Woodbridge Research Facility currently stores and uses, as needed, commercially available surge protector tubes, each containing a small amount of radioactive material sealed within the tube. Currently, there are 90 of these tubes, with a total of 2.2 mCi of H-3 and 2.2 mCi of Pm-147. These tubes contain very small quantities of radioactive material and no special permitting or licensing is required. When no longer needed, the tubes are disposed of as radioactive waste, or returned to the manufacturer for disposal. Presently, operational requirements to use these tubes are being eliminated; subsequently, the tubes will not be included in the realignment to ALC.

5.2 SOCIOECONOMIC CONSEQUENCES

5.2.1 Description of Function Realignment

The functional transfers to ALC include an estimated 213 from Fort Monmouth, New Jersey; 90 from Woodbridge, Virginia; 58 from WSMR, New Mexico; and 100 from NVEOD, Fort Belvoir, Virginia and 12 ARL military positions. In addition, 5 vacant civilian spaces are to be reallocated from the Vulnerability Assessment Lab (VAL) in WSMR, New Mexico to ALC. Concurrently, approximately 128 positions at ALC will transfer out to Huntsville, Alabama; Picatinny Arsenal, New Jersey; and APG, Maryland. Consolidation and realignment will eliminate approximately 387 positions, primarily civilian, at ALC. Including 17 ARL reallocations, the overall effect is a net loss of about 35 ARL personnel.

5.2.2 Description of EIFS Model

The Economic Impact Forecast System (EIFS) model was used as the basis for determining the socioeconomic impacts discussed in this section. A description of the EIFS model is presented in Appendix D.

5.2.3 Region of Influence

Montgomery and Prince George's Counties were used as the region of influence (ROI) in the EIFS model, considering the location of ALC in both counties and the operational size of ALC. The two counties have a combined population of nearly 1.5 million. In assessing the appropriate ROI for the purpose of implementing the EIFS model, it was concluded that if a larger area were used, it would have to be the entire Washington, D.C. Metropolitan Statistical Area (MSA). While this would have resulted in a larger export income multiplier because of the increased magnitude of the economy being examined, it would have reduced the significance of the results. To assess the maximum impact on the surrounding communities' service facilities, it was assumed that all impacts will take place within the two county area. This results in a worst case scenario in terms of identifying the potential impacts and their level of significance.

5.2.4 EIFS Data Inputs

EIFS is structured to examine economic impacts in two phases: construction and operation. The information requirements and assumptions used in EIFS to assess the potential economic impacts of the proposed action on Montgomery and Prince George's Counties for each phase are described below.

The EIFS model was run assuming that implementation of ARL personnel changes will not commence during the first year of construction (1993). For the subsequent four years (1994-1997), a combined analysis of construction and operation was undertaken, including an analysis of the mission change. Operational changes will entail a net loss of approximately 35 ARL positions at ALC. However, a detailed breakdown of the personnel changes was incorporated into the EIFS model to assess the socioeconomic effect of the mission change.

The total construction budget is projected to be $115 million. Using EIFS baseline data, it was determined that $68.4 million of the construction budget will be spent within the two-county area over a four-year period. For the EIFS model, ALC's nonsalary expenditures were assumed to remain constant throughout the analysis period. The average salary of all civilian and military personnel transferring in and out of ALC was estimated to be $38,000 and $30,000 respectively. Approximately 30 percent of the civilian personnel scheduled to be transferred from the realigning installations are expected to transfer. The remaining vacant functions (70 percent) were assumed to be filled by personnel both from within, as well as from outside the two-county area.

5.2.5 EIFS Outputs

The $115 million construction budget is expected to result in nearly $144 million in additional expenditures in the two-county area over the five-year analysis period, including direct construction expenditures and indirect (induced) expenditures (a result of the multiplier effect). Local material and salary expenditures of the construction budget will result in the creation of approximately 2,200 person years of employment within the ROI during the five-year period. Increased employment opportunities during these five years will further result in an estimated $49 million increase in local income. However, because the construction phase will be of limited duration, lasting economic and employment impacts in the ROI attributable to construction expenditures will be minimal.

The first year of construction expenditures is projected to result in regional increases in sales volume, employment, and income (Table 5-6). During the following four years of combined construction and tenant move-in at ALC, sales volume, employment and income are all expected to increase. Maximum economic impacts will occur during the first and last years of construction/implementation. Economic impacts during years two through four of the implementation/construction process are of lower magnitude due to short-term reductions in the size of the personnel at ALC during that three-year period. Overall, however, economic impacts through each of the three years are positive as a result of construction expenditures.

5.2.6 Significance of Outputs

The Rational Threshold Value (RTV) model provides boundaries (threshold values) to assess the significance of an action's effects on a region. If the changes predicted by EIFS fall outside the boundaries specified by the RTV, those changes may have a significant effect on the region, necessitating some specific mitigative action. In this EIFS analysis, the RTV was set for three primary indicators of socioeconomic change: business (sales) volume, employment, and income. The assessment of economic impacts during the first year, which will only entail construction, resulted in positive percentage changes which are within RTV thresholds. The assessment of economic impacts during the four years in which both construction and implementation of the ARL realignment are expected to take place also resulted in positive percentage changes which are within RTV thresholds.

5.3 MITIGATION ACTION SUMMARY

Best management practices and standard operating procedures will be implemented during construction and operation of the ARL facilities in order to minimize the potential adverse environmental effects. The new and renovated facilities will aslo include state-of-the-art provisions for air quality and noise control, pretreatment of industrial wastewater, and the storage and handling of hazardous materials and wastes.

In addition to these standard practices and provisions, temporary off-site parking will be provided during construction to offset the lost on-site parking.

Archeological investigations will be completed to identify potential cultural resources and if potential resources are identified, to determine NRHP eligibility. If any identified sites are determined to be NRHP eligible, appropriate mitigative plans will be prepared in consultation with the Maryland SHPO, and implemented prior to or during construction.

Table 5-7 presents a summary of the measures to minimize impacts of the proposed action at ALC. For most of the resource areas, the measures will be the same for all site plans. Any differences are noted in the table.

TABLE 5-6
EIFS MODEL OUTPUT FOR THE ROI

	1993 Construction			1994 Construction and Operation			1995 Construction and Operation			1996 Construction and Operation			1997 Construction and Operation		
		Δ%	RTV (%)		Δ%	RTV (%)		Δ%	RTV (%)		Δ%	RTV (%)		Δ%	RTV (%)
Export Income Multiplier	2.4679			2.4679			2.4679			2.4679			2.4679		
Change in Local:															
Sales Volume															
Direct	11,669,000			8,875,000			8,887,000			8,675,000			19,162,000		
Induced	17,128,000			13,026,000			13.045,000			12,734,000			28,127,000		
Total	28,797,000	0.115	8.943	21,901,000	0.085	8.943	21,932,000	0.085	8.943	21,409,000	0.083	8.943	47,289,000	0.195	8.943
Employment															
Direct	107			79			79			77			182		
Total	440	0.071	3.112	264	0.043	3.112	265	0.043	3.112	252	0.041	3.112	915	0.147	3.112
Income															
Direct	2,031,000			1,503,000			1,505,000			1,465,000			3,447,000		
Total	9,979,000	0.040	6.616	4,634,000	0.019	6.616	4,670,000	0.019	6.616	4,267,000	0.017	6.616	24,381,000	0.97	6.616

Source: EIFS Model

TABLE 5-7
SUMMARY OF MEASURES TO MINIMIZE IMPACTS AT ALC

Affected Resource	Mitigation
Air Quality	Construction Comply with state or local regulations governing material hauling in open-bodied trucks. Re-seed disturbed areas. Use crushed rock surface on high-traffic areas; dust suppression (e.g., watering) on low-traffic areas and where construction occurs on bare ground. Use dust control systems on any concrete batch plant.
Water Resources	Construction Employ erosion and sediment control measures. Implement spill contingency plans. Operation Implement a stormwater management program to maintain pre-development peak discharge rates. Modify the existing ALC SPCC Plan and ISCP to accommodate the proposed action.
Soils	Implement slope stability measures as necessary (Site Plan Nos. 2, 3, and 4).
Wastewater	Perform pretreatment of industrial effluent prior to discharge to WSSC.
Transportation	Construction Phase construction to minimize impact on employee parking by constructing parking structure first. Coordinate construction worker schedule and material delivery schedule to avoid rush hour peaks. Provide temporary parking facilities.
Hazardous and Toxic Materials	Construction Implement spill contingency plans. Operation Modify the existing SPCC Plan and ISCP to accommodate the proposed action. Modify ALC's RCRA permit to accommodate the proposed action.
Plant, Animal and Aquatic Ecology	No mitigation required.

TABLE 5-7 (Cont'd)
SUMMARY OF MEASURES TO MINIMIZE IMPACTS AT ALC

Affected Resource	Mitigation
Cultural Resources	Phase I archeological testing of undisturbed areas. Other mitigation as necessary to comply with Sections 106 and 110 of NHPA.
Noise	Construction Prohibit nighttime construction or the use of loud equipment at night, if noise levels exceed 55 dBA. Operation Design facilities to comply with state noise standards.

6.0 CONCLUSIONS AND FINDINGS

The proposed realignment of ARL research functions at ALC will have no significant impact. The construction of new structures and renovation of existing facilities at ALC are necessary to allow ARL to conduct state-of-the-art research. Operations of the new facilities will be similar to those of the existing laboratory facilities at ALC. There will be a net decrease of approximately 35 ARL positions at ALC.

Alternatives evaluated included no action, accommodation with existing on-post facilities, constructing or leasing space off post, and renovation and construction of new facilities on post. The no-action alternative would be inconsistent with the mandate of BRAC 91, and the off-post space alternatives would not be cost-effective and would not achieve the realignment objective of centralizing research activities. The ARL facilities could not be accommodated by existing on-post facilities, or by renovation of existing facilities without new construction. Therefore, these alternatives were not considered further. The renovation and construction of new facilities at ALC was found to be consistent with BRAC 91 objectives.

Five site plans for renovation and construction at ALC were evaluated. All site plans would have similar potential construction-related impacts, but with minor differences: disruption of existing activities in the 200 Area; increased traffic and disruption of on-post parking; and increased noise levels at ALC and the NRTC (Table 6-1). Site Plan Nos. 3 and 4 would affect biological resources through the clearing of approximately two acres of presently undisturbed wooded land in the 400 Area for the clean room building and wastewater pretreatment facility. Site Plan Nos. 3 and 4 could affect archeological resources in the 400 Area. Site Plan Nos. 3 and 4 would require construction of additional utility lines to the 400 Area. Potential construction-related impacts will be minimized by the following: phased construction, erosion and sediment controls; a SPCC Plan and ISCP; and temporary parking.

All site plans are consistent with the ALC facility Master Plan. Site Plan Nos. 2, 3, and 4 would have very minor increased stormwater runoff because of the necessary additional land development. All of the site plans would require handling and disposal of the same types and amounts of hazardous materials. All of the site plans would have similar minor increases in air emissions from laboratory vents and boiler stacks. Measures to reduce potential impacts during operation include the following: a stormwater management program; modifying the existing SPCC Plan and ISCP to accommodate the proposed action; implementing slope stability measures (Site Plan Nos. 2, 3 and 4 only); pretreating the industrial effluent prior to discharge to WSSC; modifying the existing RCRA Consent Agreement to accommodate the proposed action; and designing the facilities to comply with state noise levels.

Site Plan Nos. 3 and 4 were found to have greater potential impacts than, and would not be operationally as efficient as, Site Plan Nos. 1, 2, and 5. Consequently, Site Plan Nos. 3 and 4 were dropped from further consideration. Site Plan Nos. 1, 2 and 5 were found to have no cumulative or individual significant impact on the quality of the human environment

or upon natural resources. The difference among the plans with regard to potential environmental impacts was minor. Site Plan No. 5 would cause the least visual effect but the greatest disruption to existing operations during construction. No significant differences were identified among the site plans with regard to economic effects. For all site plans, minor positive socioeconomic benefits will occur during construction of the ARL facilities at ALC. Prior to construction, the requirements for compliance with the NHPA will be met. A Finding of No Significant Impact (FNSI) is recommended to be published for the proposed realignment of ARL activities at ALC. Consequently, an EIS is not required for the proposed action.

TABLE 6-1
COMPARISON OF SITE PLANS AT ALC

Resource	Site Plan No. 1	Site Plan No. 2	Site Plan No. 3	Site Plan No. 4	Site Plan No. 5
Land Use	Minor impact due to temporary disruption of 200 Area laboratory facility during construction.	Minor impact due to temporary disruption of 200 Area laboratory facility during construction. Conversion of small area of undeveloped land for wastewater pretreatment plant.	Minor impact due to temporary disruption of 200 Area laboratory facility during construction. Conversion of approximately 2 acres from wooded to developed land use.	Minor impact due to temporary disruption of 200 Area laboratory facility during construction. Conversion of approximately 2 acres from wooded to developed land use.	Moderate impact due to temporary disruption of 200 Area laboratory facility during construction.
Air Quality	Temporary, localized fugitive dust impact at ALC and NRTC. Insignificant emissions impact.	Temporary, localized fugitive dust impact at ALC and NRTC. Insignificant emissions impact.	Temporary, localized fugitive dust impact at ALC and NRTC. Insignificant emissions impact.	Temporary, localized fugitive dust impact at ALC and NRTC. Insignificant emissions impact.	Temporary, localized fugitive dust impact at ALC and NRTC. Insignificant emissions impact.
Surface Water	Insignificant impact.	Insignificant impact.	Insignificant impact.	Insignificant impact.	Insignificant impact.
Groundwater	Insignificant impact.	Insignificant impact.	Insignificant impact.	Insignificant impact.	Insignificant impact.
Geology and Soils	Insignificant impact.	Potential need for slope stability measures.	Insignificant impact.	Potential need for slope stability measures.	Potential need for slope stability measures.
Utilities	Insignificant impact.	Insignificant impact.	Possible extension of electrical lines. Possible construction of natural gas line.	Possible extension of electrical lines. Possible construction of natural gas line.	Insignificant impact.
Transportation	Minor impact due to increased traffic from construction workers and material delivery; temporary disruption of on-post parking.	Minor impact due to increased traffic from construction workers and material delivery; temporary disruption of on-post parking.	Minor impact due to increased traffic from construction workers and material delivery; temporary disruption of on-post parking.	Minor impact due to increased traffic from construction workers and material delivery; temporary disruption of on-post parking.	Minor impact due to increased traffic from construction workers and material delivery; temporary disruption of on-post parking.
Hazardous Materials	Increase in volume of hazardous waste generated but insignificant impact.	Increase in volume of hazardous waste generated but insignificant impact.	Increase in volume of hazardous waste generated but insignificant impact.	Increase in volume of hazardous waste generated but insignificant impact.	Increase in volume of hazardous waste generated but insignificant impact.

TABLE 6-1
COMPARISON OF SITE PLANS AT ALC

Resource	Site Plan No. 1	Site Plan No. 2	Site Plan No. 3	Site Plan No. 4	Site Plan No. 5
Terrestrial Ecology	Insignificant impact.	Very minor impact due to clearing of one acre of grass and sapling trees.	Minor impact due to clearing of 2 acres of wooded land.	Minor impact due to clearing of 2 acres of wooded land.	Insignificant impact.
Aquatic Ecology	Insignificant impact.	Insignificant impact.	Insignificant impact.	Insignificant impact.	Insignificant impact.
Cultural Resources	Archeological surveys will be completed before construction begins. The potential effects on cultural resources will be assessed in accordance with the NHPA.	Archeological surveys will be completed before construction begins. The potential effects on cultural resources will be assessed in accordance with the NHPA.	Archeological surveys will be completed before construction begins. The potential effects on cultural resources will be assessed in accordance with the NHPA.	Archeological surveys will be completed before construction begins. The potential effects on cultural resources will be assessed in accordance with the NHPA.	Archeological surveys will be completed before construction begins. The potential effects on cultural resources will be assessed in accordance with the NHPA.
Aesthetic Values	Moderate decrease in aesthetic value due to increase in concentration of built up areas.	Moderate decrease in aesthetic value due to increase in concentration of built up areas.	Moderate decrease in aesthetic value due to increase in concentration of built up areas.	Moderate decrease in aesthetic value due to increase in concentration of built up areas.	Moderate decrease in aesthetic value due to increase in concentration of built up areas.
Recreation	Disruption to lunch time employee nature strolls during construction.	Disruption to lunch time employee nature strolls during construction.	Disruption to lunch time employee nature strolls during construction.	Disruption to lunch time employee nature strolls during construction.	Disruption to lunch time employee nature strolls during construction.
Socioeconomics	Positive benefits but not regionally significant.	Positive benefits but not regionally significant.	Positive benefits but not regionally significant.	Positive benefits but not regionally significant.	Positive benefits but not regionally significant.
Noise	Minor interruptions to ALC and NRTC personnel during construction.	Minor interruptions to ALC and NRTC personnel during construction.	Minor interruptions to ALC personnel during construction.	Minor interruptions to ALC and NRTC personnel during construction.	Minor interruptions to ALC and NRTC personnel during construction.

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APPENDIX A

AIR QUALITY IMPACT ANALYSIS PROGRAM OUTPUT

SUMMARY OF METEOROLOGICAL DATA COLLECTED AT
BELTSVILLE, MARYLAND

Parameter Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
ABS MAX TMP (F)	78	75	88	92	96	98	102	102	101	98	85	74	102
MEAN MAX TMP (F)	44	46	52	66	75	82	87	85	79	68	57	45	66
MEAN MIN TMP (F)	23	25	30	41	50	58	64	62	55	44	32	24	42
ABS MIN TMP (F)	-15	-2	-1	21	26	38	45	42	29	22	12	-6	-15
MEAN NO DYS TMP = OR GTR 90(F)	0	0	0	1.0	1.0	6.0	11.0	8.0	3.0	1.0	0	0	31.0
MEAN NO DYS TMP = OR LES 32(F)	27.0	24.0	21.0	6.0	1.0	0	0	0	0.3	5.0	18.0	25.0	127.3
MEAN NO DYS TMP = OR LES 0(F)	-	0	0	0	0	0	0	0	0	0	0	-	-
MEAN DEW PT TMP (F)	25	26	30	41	52	61	66	65	60	48	36	27	45
MEAN REL HUM (PCT)	67	66	64	63	69	70	71	74	75	73	69	68	69
MEAN PRESS ALT (FT)	28	53	96	116	110	128	120	91	55	33	36	43	76
MEAN PRECIP (IN)	2.79	2.66	3.63	3.00	3.94	4.19	4.29	5.16	3.45	3.18	3.04	2.92	42.3
MEAN SNOW FALL (IN)	5.2	4.9	5.1	0.2	0	0	0	0	0	0	1.4	3.2	20.0
MEAN NO DYS PRCP = OR GTR 0.1 IN	5.9	5.7	6.6	6.1	6.8	7.0	7.1	7.9	5.6	5.2	5.0	6.1	75.0
MEAN NO DYS SNFL = OR GTR 1.5 IN	1.3	1.0	1.0	0.1	0	0	0	0	0	0	0.3	0.7	4.4
MEAN NO DYS W/OCUR VSBY LES 1/2 MI	4.3	4.9	4.2	2.7	3.4	1.7	1.4	2.8	3.5	4.2	3.0	4.8	40.9
MEAN NO DYS TSTMS	0	0.1	1.1	2.7	5.6	5.6	7.6	5.9	2.6	1.0	0.5	0.1	32.8

Data Source: ISMCS CD-ROM October 1990

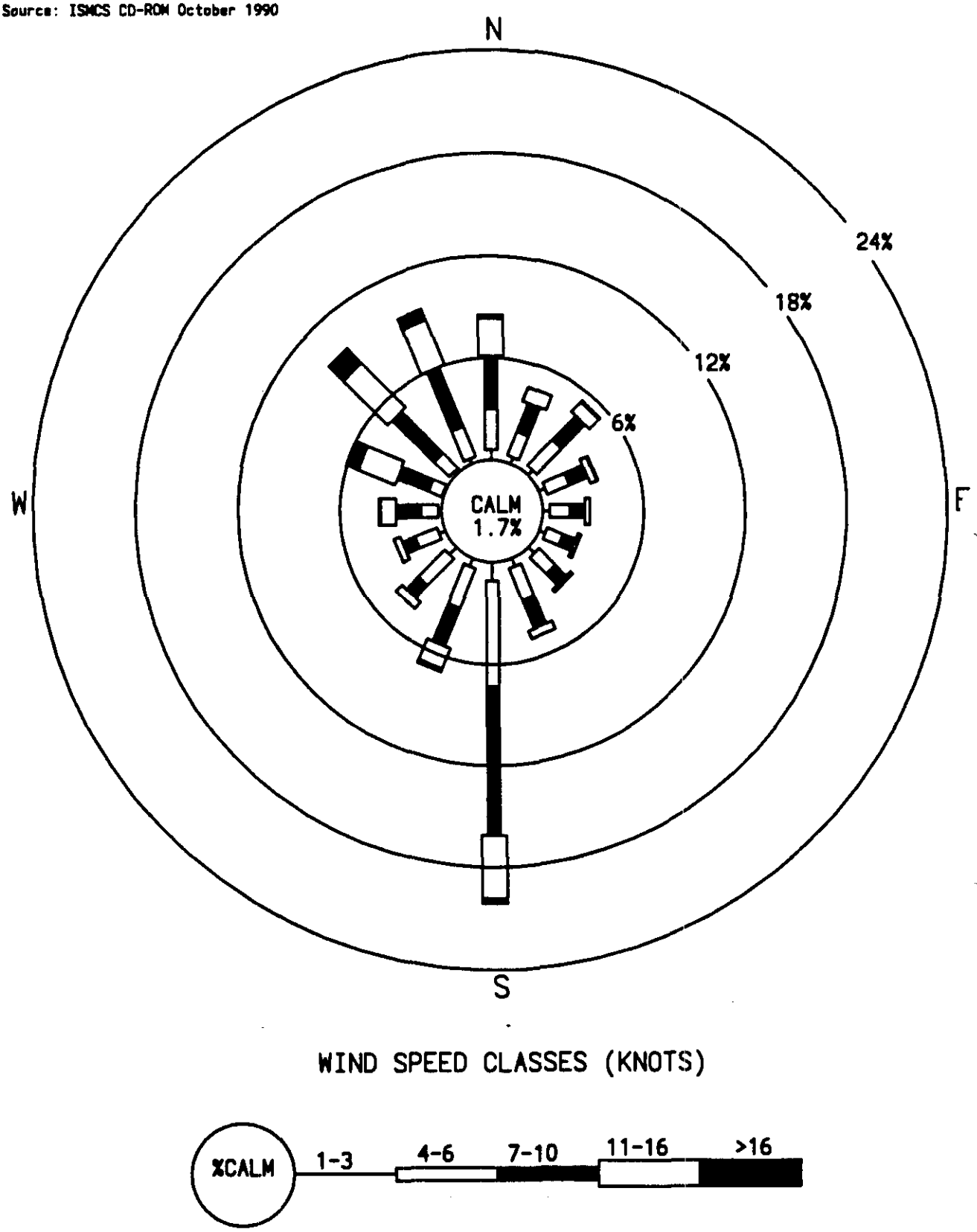

FIGURE WIND ROSE COMPILED FROM WASHINGTON, D.C. NATIONAL AIRPORT 1980-1989 DATA

SCREEN MODEL OUTPUT

02-26-92
15:09:24

*** SCREEN-1.1 MODEL RUN ***
*** VERSION DATED 88300 ***

Boiler

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.000
STACK HEIGHT (M)	=	12.20
STK INSIDE DIAM (M)	=	.91
STK EXIT VELOCITY (M/S)	=	18.29
STK GAS EXIT TEMP (K)	=	449.70
AMBIENT AIR TEMP (K)	=	293.00
RECEPTOR HEIGHT (M)	=	.00
IOPT (1=URB,2=RUR)	=	1
BUILDING HEIGHT (M)	=	9.14
MIN HORIZ BLDG DIM (M)	=	67.00
MAX HORIZ BLDG DIM (M)	=	67.00

BUOY. FLUX = 13.05 M**4/S**3; MOM. FLUX = 45.52 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
100.	104.3	3	4.0	4.2	1280.0	20.6	21.6	20.0	SS
200.	42.19	4	5.0	5.3	1600.0	28.2	30.8	27.2	SS
300.	26.20	4	4.0	4.2	1280.0	38.6	45.4	40.2	SS
400.	20.46	4	3.0	3.2	960.0	50.2	59.4	52.9	SS
500.	16.81	4	2.0	2.1	640.0	73.6	73.0	65.3	SS
600.	15.95	5	2.0	2.1	5000.0	60.6	59.3	34.8	SS
700.	17.58	5	1.0	1.1	5000.0	80.8	70.8	43.7	NO
800.	18.71	5	1.0	1.1	5000.0	80.8	79.1	47.4	NO
900.	19.18	5	1.0	1.1	5000.0	80.8	87.1	50.9	NO
1000.	19.19	5	1.0	1.1	5000.0	80.8	95.0	54.3	NO
1100.	18.92	5	1.0	1.1	5000.0	80.8	102.7	57.5	NO
1200.	18.46	5	1.0	1.1	5000.0	80.8	110.3	60.6	NO
1300.	17.89	5	1.0	1.1	5000.0	80.8	117.6	63.6	NO
1400.	17.27	5	1.0	1.1	5000.0	80.8	124.8	66.6	NO
1500.	16.63	5	1.0	1.1	5000.0	80.8	131.9	69.4	NO
1600.	15.99	5	1.0	1.1	5000.0	80.8	138.8	72.1	NO
1700.	15.36	5	1.0	1.1	5000.0	80.8	145.6	74.8	NO
1800.	14.76	5	1.0	1.1	5000.0	80.8	152.2	77.4	NO
1900.	14.18	5	1.0	1.1	5000.0	80.8	158.8	79.9	NO
2000.	13.63	5	1.0	1.1	5000.0	80.8	165.1	82.4	NO
2100.	13.10	5	1.0	1.1	5000.0	80.8	171.4	84.8	NO
2200.	12.61	5	1.0	1.1	5000.0	80.8	177.6	87.1	NO
2300.	12.14	5	1.0	1.1	5000.0	80.8	183.6	89.4	NO
2400.	11.70	5	1.0	1.1	5000.0	80.8	189.6	91.6	NO
2500.	11.29	5	1.0	1.1	5000.0	80.8	195.4	93.8	NO

2600.	10.89	5	1.0	1.1	5000.0	80.8	201.2	96.0	NO
2700.	10.53	5	1.0	1.1	5000.0	80.8	206.9	98.1	NO
2800.	10.18	5	1.0	1.1	5000.0	80.8	212.4	100.2	NO
2900.	9.850	5	1.0	1.1	5000.0	80.8	217.9	102.2	NO
3000.	9.539	5	1.0	1.1	5000.0	80.8	223.3	104.2	NO
3500.	8.219	5	1.0	1.1	5000.0	80.8	249.3	113.7	NO
4000.	7.198	5	1.0	1.1	5000.0	80.8	273.6	122.5	NO
4500.	6.390	5	1.0	1.1	5000.0	80.8	296.5	130.8	NO
5000.	5.738	5	1.0	1.1	5000.0	80.8	318.1	138.6	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 100. M:

100.	104.3	3	4.0	4.2	1280.0	20.6	21.6	20.0	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SCREEN DISCRETE DISTANCES ***
****

TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
10.	.0000	0	.0	.0	.0	.0	.0	.0	NA
20.	.0000	0	.0	.0	.0	.0	.0	.0	NA
30.	222.3	1	3.0	3.1	960.0	14.2	9.5	7.3	SS
40.	238.3	1	3.0	3.1	960.0	15.5	12.7	9.8	SS
50.	220.9	3	4.0	4.2	1280.0	15.2	10.9	10.0	SS
60.	195.8	3	4.0	4.2	1280.0	16.2	13.0	12.0	SS
70.	167.6	3	4.0	4.2	1280.0	17.3	15.2	14.0	SS
80.	142.5	3	4.0	4.2	1280.0	18.4	17.3	16.0	SS
.	121.5	3	4.0	4.2	1280.0	19.5	19.5	18.0	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	.0000	CONC (UG/M**3)	=	.0000
CRIT WS @10M (M/S)	=	99.99	CRIT WS @10M (M/S)	=	99.99
CRIT WS @ HS (M/S)	=	99.99	CRIT WS @ HS (M/S)	=	99.99
DILUTION WS (M/S)	=	99.99	DILUTION WS (M/S)	=	99.99
CAVITY HT (M)	=	9.14	CAVITY HT (M)	=	9.14
CAVITY LENGTH (M)	=	41.39	CAVITY LENGTH (M)	=	41.39
ALONGWIND DIM (M)	=	67.00	ALONGWIND DIM (M)	=	67.00

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION	MAX CONC	DIST TO	TERRAIN

PROCEDURE	(UG/M**3)	MAX (M)	HT (M)
SIMPLE TERRAIN	238.3	40.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

APPENDIX B

LIST OF CHEMICALS CURRENTLY USED AT ETDL

CHEMICAL NAME

1,1,1-Trichloroethane, methylchloroform
1,3-BUTADIENE
1,3-BUTADIENE
1,4-Dioxane
10% HYDROGEN/90% NITROGEN
113 TRICHLOROTRIFLUOROETHANE
2-ETHOXYETHANOL
2-ETHOXYETHEL ACETATE
2-ETHOXYETHEL ACETATE
2-METHOXYETHANOL
2-PROPANOL
611 MILDLY ACTIVATED ROSIN FLUX
800 ZINC PHOSPHATE CONDITIONER
ACETIC ACID, GLACIAL
ACETIC ANHYDRIDE
ACETIC ANHYDRIDE
ACETONE
ACETONE
ACETONITRILE
ACETYLENE
ALUMINUM CHLORIDE ANHYDROUS
ALUMINUM METAL
AMMONIA
AMMONIUM CHLORIDE
AMMONIUM FLOURIDE 40% CR LOW PARTICULATE
AMMONIUM HYDROXIDE
AMMONIUM HYDROXIDE
AMMONIUM OXALATE (Anhydrous)
AMMONIUM OXALATE (Hydrated)
ANHYDROUS AMMONIA
ARGON
ARSENIC
ARSINE
AZOBISISOBUTYRONITRILE
AZROCK CLEAR BRUSH-ON OR CLEAR THIN SPRD
AZROCK CLEAR BRUSH-ON OR CLEAR THIN SPRD
BENZENE
BENZOIC ACID
BENZOYL PEROXIDE, DRY
BENZOYL PEROXIDE, DRY
BERYLLIUM METAL/POWDER
BERYLLIUM METAL/POWDER
BOE ETCHANTS (Buffered Oxide Etchants)
BORON TRICHLORIDE
BORON TRIFLOURIDE
BUTANE
BUTANE
BUTYL ACETATE MOS OR SEMI GRADE
BUTYL ACETATE MOS OR SEMI GRADE
CALCIUM CHLORIDE
CALCIUM HYDROXIDE
CALCIUM SULFATE (Anhydrous)
CALCIUM SULFATE (Dihydrate)
CARBON BLACK OIL PELLETS

CHEMICAL NAME

CARBON DIOXIDE
CARBON DIOXIDE
CARBON MONOXIDE
CARBON MONOXIDE
CARBON TETRACHLORIDE
CARBON TETRAFLOURIDE
CARBONYL IRON POWDER - GRADE E
CARBONYL SULFIDE
CESIUM, INGOT, 99.5%
CHLORINE
CHLORINE TRIFLOURIDE
CHLOROBENZENE
CHLOROFORM
CHROMIC ACID TECH FLAKED
CHROMIUM
CHRYSOTILE ASBESTOS
CINCOOL STANDARD
COBALT
COLUMBIUM POWDER
CONDUCTROX 3017
COPPER SULFATE, BLUESTONE
CUPRIC SULFATE SOLUTION LIQUID COPPER SU
CYCLOHEXANE
DECAP
DEUTERIUM
DIBORANE
DIBORANE
DICHLORODIFLUOROMETHANE
DICHLOROSILANE
DIESEL FUEL OIL NO. 2-D
DIETHYL CARBONATE
DIETHYL CARBONATE
DIETHYL ETHER
DIMETHYL CARBONATE
DIMETHYL ETHER
DIMETHYL SULFOXIDE
DIMETHYLAMINE
DISILANE
DOW CORNING(R) 704 DIFFUSION PUMP FLUID
DYNASOLVE 100
DYNASOLVE 160
EPON CURING AGENT (R) V-40
ERBIUM
ERBIUM FLOURIDE
ETHANE
ETHYL ACETYLENE
ETHYL ALCOHOL
ETHYL CHLORIDE
ETHYL ETHER
ETHYLENE
ETHYLENE GLYCOL
ETHYLENE OXIDE
ETHYLENE OXIDE
EUROPIUM METAL
FC-40 FLOURINERT BRAND ELECTRONIC LIQUID

CHEMICAL NAME

FC-77 FLOURINERT BRAND ELECTRONIC LIQUID
FERRIC CHLORIDE SOLUTION
FERROUS AMMONIUM SULFATE
FLUORINE
FLUOROBORIC ACID
FLUOROFORM
FLUOROFORM
FORMALDEHYDE
FORMALIN
FREON 12
FREON TF SOLVENT
GADOLINIUM
GADOLINIUM OXIDE
GALLIUM, 99.999%
GALLIUM ARSENIDE
GALLIUM (III) OXIDE
GE RTV SILCONE PASTE, ACETOXY-CURE
GERMANIUM
GETTYSOLVE B (Tradename Getty Oil Co.)
GETTYSOLVE C (Tradename Getty Oil Co.)
GLYPTAL 7815
GOLD
GOLD PLATING SOL'N
HALOCARBON 13B-1
HALOCARBON 22
HELIUM
HEXAFLUOROETHANE
HEXANE ISOMERS (Other than n-HEXANE)
HOLMIUM
HOLMIUM FLUORIDE
HOLMIUM OXIDO
HYDROCHLORIC ACID
HYDROFLUORIC ACID
HYDROFLUORIC ACID, ANHYDROUS
HYDROFLUORIC ACID, AQUEOUS (47-70%)
HYDROFLUORIC ACID, ELECTRONIC & REAGENT
HYDROGEN
HYDROGEN BROMIDE
HYDROGEN CHLORIDE
HYDROGEN CYANIDE
HYDROGEN FLUORIDE
HYDROGEN PEROXIDE, 30%
HYDROGEN PEROXIDE (>60%)
HYDROGEN SULFIDE
HYDROQUINONE
INDIUM METAL
INDIUM (III) OXIDE
INHIBITED 1,1,1-TRICHLOROETHANE
IODINE PENTAFLUORIDE
IONICALLY EQUIVALENT MIXTURE OF STYRENE
IRON
ISOBUTANE
ISOBUTYLENE
ISOPAR G
ISOPAR M

CHEMICAL NAME

ISOPROPYL ALCOHOL
ISOPRYL ALCOHOL
KEROSINE BURNER FUEL
KESTER 197 RESIN FLUX
KRYPTON
LANTHANUM FLUORIDE
LATTICE ETCH
LEAD CADMIUM BOROSILICATE GLASS
LEAD METHACRYLATE
LIQUIFIED PROPANE
LITHIUM TETRAFLUOROBORATE
LUTETIUM FLUORIDE
MAGNESIUM
MAGNESIUM CARBONATE
MAGNESIUM NITRATE
MERCURY
METHANE
METHANOL
METHYL ALCOHOL
METHYL BROMIDE
METHYL CHORIDE
METHYL ETHYL KETONE
METHYL FLUORIDE
METHYL ISOBUTYL KETONE
METHYLENE CHLORIDE
MICROPOSIT 111S PHOTO RESIST
MICROPOSIT 111S PHOTO RESIST
MICROPOSIT 1350 J PHOTO RESIST
MICROPOSIT 1350 J PHOTO RESIST
MICROPOSIT MF-312 DEVELOPER
MICROPOSIT(R) 303 A DEVELOPER
MINERAL SPIRITS, TYPE I
MIXED ALCOHOLS (ETHANOL)
MIXED ALCOHOLS (ETHANOL)
MOLYBDENUM
MONOCHLOROBENZENE
NANOSTRIP
NEODYMIUM
NEODYMIUM OXIDE
NEON
NEUTRA-CLEAN(R) 68
NEU-TRI SOLVENT
NICKEL
NITRIC ACID
NITRIC OXIDE
NITROGEN
NITROGEN DIOXIDE
NITROGEN TRIFLUORIDE
NITROGEN TRIOXIDE
No. 3, No. 4, No. 5 STRIPPING SOLUTIONS
n-BUTYL ALCOHOL
n-BUTYL ALCOHOL
n-HEPTANE
n-HEXANE
OXYGEN

CHEMICAL NAME

PERCHLORETHYLENE
PETROLEUM HYDROCARBON
PETROLEUM "ETHER" HIGH BOILING
PHOSPHINE
PHOSPHORIC ACID
PHOSPHORIC ACID (>75%)
PHOSPHORIC ACID (>75%)
PLATINUM
POLY GLYCOLIC ACID
POLY GLYCOLIC ACID
POLY METHACRYLATE ACID
POLY VINYL CHLORIDE
POLY (ISO-BUTYL METHACRYLATE)-BEADS
POLY (VINYLIDENE FLUORIDE)
POLYACETAL
POLYVINYLPERROLIDONE
POLY(ETHELYNE), LOW DENSITY
POLY(METHYL METHACRYLATE), BEAD POLYMER
POLY(METHYL METHACRYLATE-METHYACRYLIC AC
POLY(T-BUTYL METHACRYLATE)
POLY(VINYL BUTYRAL)
POTASSIUM BIPHTHALATE
POTASSIUM HYDROXIDE 45% SOLN ELEC GRADE
POTASSIUM PERMANGANATE
PRASEODYMIUM METAL
PROPANE
PROPYLENE
PROPYLENE CARBONATE
PROPYLENE GLYCOL INDUSTRIAL
PROPYLENE OXIDE
PUROXYLIN PURIFIED CHIPS
RUTHENIUM
SAPONIN
SHELL DIALA(R) OIL AX
SILANE
SILICON, PIECES, 99.9999%
SILICON TETRACHLORIDE
SILICON TETRACHLORIDE
SILICON TETRAFLUORIDE
SILVER
SODIUM BORATE
SODIUM CARBONATE, ANHYDROUS
SODIUM CHLORIDE
SODIUM ETHOXIDE
SODIUM ETHOXIDE
SODIUM HEXAMETAPHOSPHATE
SODIUM HYDROXIDE
SODIUM HYDROXIDE, 0.02 TO 0.1
SODIUM HYDROXIDE 50% LIQUID
SODIUM HYPOCHLORITE, 5% SOLUTION
SODIUM PERSULFATE
SODIUM PHOSPHATE MONOBASIC
SOLDERON NF
SS 390 SINGLE STAGE ACTIVATOR
SULFOLANE

CHEMICAL NAME

SULFUR DIOXIDE
SULFUR TETRAFLUORIDE
SULFURIC ACID, CONCENTRATED
SULFURIC ACID, CONCENTRATED
SULFURIC ACID CR LOW PARTICULATE GRADE
TANTALUM
TANTALUM (V) OXIDE
TELLURIUM, INGOT, 99.999%
TELLURIUM, INGOT, 99.999%
TETRABUTYLAMMONIUM ACETATE
TETRABUTYLAMMONIUM METHANESULFONATE
TETRACHLOROETHYLENE SEMI GRADE
TETRAFLUOROETHYLENE
TETRAFLUOROMETHANE
TETRAHYDROFURAN - 99
TETRAPHENYLARSONIUM CHLORIDE
TETRAPHENYLPHOSPHONIUM CHLORIDE
TETRAPROPYLAMMONIUM BROMIDE
THALLIUM
TIN
TITANIUM BORIDE
TRICHLOROACETIC ACID
TRICHLOROETHYLENE
TRIMETHYLAMINE
TYRIN (R) 3615 CHLORINATED POLYETHELENE
URESOLVE 411/URESOLVE BLUE
URESOLVE NF/URESOLVE PLUS
VANADIUM (V) OXIDE
VINYL BUTYL ETHER
VM&P NAPHTHA (Rule 66 Exempt)
XENON
XYLENE
YTTERBIUM FLUORIDE
YTTERBIUM OXIDE
ZINC OXIDE
ZIRCONIUM SPONGE
ZN
#135 ROSIN FLUX
(CUPRIC)COPPER (II) SULFATE, MONOHYDRATE
(CUPRIC)COPPER (II) SULFATE,PENTAHYDRATE

APPENDIX C

ENDANGERED SPECIES LETTERS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
DIVISION OF ECOLOGICAL SERVICES
1825 VIRGINIA STREET
ANNAPOLIS, MARYLAND 21401

May 7, 1992

Ms. Terry Garnett
Ebasco Environmental
2111 Wilson Blvd.
Suite 435
Arlington, VA 22201

Re: Endangered Species
U.S. Army National laboratories (ARL)
Adelphi and Aberdeen, Maryland

Dear Ms. Garnett:

This responds to your January 17, 1992, request for information on the presence of species which are Federally listed or proposed for listing as endangered or threatened in the project areas on the cited facilities to be affected by development of a new laboratory building and adjacent parking lots. We have reviewed the information you enclosed and are providing comments in accordance with Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Except for occasional transient individuals, no Federally listed or proposed endangered or threatened species are known to exist in the vicinity of the Adelphi site. Therefore, no Biological Assessment or further Section 7 Consultation is required with the Fish and Wildlife Service (Service) concerning developments on this facility. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered. This response relates only to endangered species under our jurisdiction. For information on other rare species, you should contact the Maryland Heritage Program at (410) 974-2870.

One endangered species, the bald eagle (*Haliaeetus leucocephalus*) occurs in the vicinity of the laboratory sites shown on Aberdeen proving Ground, Maryland. Because of the developed nature and distance from shoreline of the sites shown on the Perryman quadrangle, we see minimal potential for impacts on bald eagles resulting from project implementation there. Moderate levels of eagle usage occur on shoreline and wetland areas adjacent to the sites shown on the Spesutie quadrangle. Potential impacts on bald eagles from development at these locations should be evaluated as a part of your EIS process.

Additional concerns of the Service include wetlands protection and the nesting requirements of neotropical migrant birds. Because of the functions and values wetlands perform and because of the national policy of no net loss of wetlands, the Service recommends avoiding wetland impacts.

All wetlands within the project area should be identified, and if construction in wetlands is proposed, the U.S. Army Corps of Engineers should be contacted for permit requirements. In addition, large tracts of forest should be maintained for neotropical migrant birds which continue to experience population declines. Many neotropical migrants require relatively large (85 acres or greater), undisturbed, and generally mature forest areas to reproduce and sustain viable populations. Projects requiring vegetation clearing can subdivide forests, creating islands of unsuitable size for many species.

Thank you for your interest in fish and wildlife issues. If you have any questions or need further assistance, please contact Andy Moser of our endangered species staff at (410) 269-5448.

Sincerely,

G. A. Mc

for John P. Wolflin
Supervisor
Annapolis Field Office

Maryland Department of Natural Resources

Resource Conservation Service
Tawes State Office Building
Annapolis, Maryland 21401

William Donald Schaefer
Governor

Torrey C. Brown, M.D.
Secretary

Donald E. MacLauchlan
Assistant Secretary

April 3, 1992

Mr. Terry Garnett
EBASCO ENVIRONMENTAL
2111 Wilson Blvd.
Suite 435
Arlington, VA 22201

RE: Aberdeen and Adelphi military facilities in Harford County

Dear Mr. Terry Garnett:

This is in response to your request for information regarding the above referenced project.

The Natural Heritage Program's database contains two areas of concern in the vicinity of the Adelphi site: Little Paint Branch Stream Valley Park and Upper Paint Branch State Park. The database lists a few historical records at Little Paint Branch, but there are no current records for Federal or State threatened or endangered species present at either project site of concern to the Natural Heritage Program.

The following recommendation is in reference to the proposed Adelphi site which are concerns of the Wildlife Division:

The forested areas on the project site may be utilized as breeding areas by Forest Interior Dwelling Birds. The habitat of these birds is rapidly disappearing in Maryland. Conservation of this habitat is not mandated outside of the Chesapeake Bay Critical Area, but we will assist those interested in voluntarily protecting this habitat.

Telephone: (410) 974-2870
DNR TTY for Deaf: 301-974-3683

If you have any questions regarding this information, contact John Moulis at (410) 827-8612.

Sincerely,

Janet McKegg

Janet McKegg, Director
Natural Heritage Program

JM:dec

cc: Cynthia Sibrel
John Moulis
Rob Northrop
Jeff Horan
Ren Serey
ER# 92.02.142

APPENDIX D

EIFS MODEL

DEPARTMENT OF THE ARMY
UNITED STATES ARMY RESEARCH LABORATORY
2800 POWDER MILL ROAD
ADELPHI, MARYLAND 20783-1197

REPLY TO
THE ATTENTION OF

October 31, 1997

Environmental Quality Branch

U.S. Environmental Protection Agency
Region III
ATTN: Ms. Yazmine Yap-Deffler (3HW71)
841 Chestnut Building
Philadelphia, PA 19107

Dear Ms. Yap-Deffler:

As an enclosure to this letter, I am providing your office with one copy of an October 1997 draft report entitled "Site 8 Area, Adelphi Laboratory Center, CERCLA Remedial Investigation". This draft report has been prepared on behalf of the Adelphi Laboratory Center by the Baltimore District, U.S. Army Corps of Engineers. This report is being submitted to your attention for review and comment.

Please provide your written comments, if any, to the attention of Mr. Robert Craig by close-of-business on December 5, 1997.

If you have any questions with regards to this request, your point-of-contact at this office is Mr. Robert Craig. Mr. Craig may be reached by telephone at (301) 394-6301, by fax at (301) 394-2660, or by e-mail at "rcraig@arl.mil".

Enclosure

KEVIN M. MASON
Environmental Coordinator

Copies Furnished (letter only):

Ms. Wanda Martinez, U.S. Environmental Protection Agency (Region III), 841 Chestnut Street, Philadelphia, PA 19107

Maryland Department of the Environment, Waste Management Administration, Federal/NPL/Superfund Division, 2500 Broening Highway, Baltimore, MD 21224
ATTN: Mr. Kim Lemaster
ATTN: Mr. Michael Angerman
ATTN: Ms. Donna Lynch

Commander, Baltimore District, U.S. Army Engineer Corps of Engineers, ATTN: CENAB-EN-GG (Mr. C. Evans), P.O. Box 1715, Baltimore, MD 21203-1715

Commander, U.S. Army Environmental Center, ATTN: SFIM-AEC-RPO (Mr. J. Waugh), Aberdeen Proving Ground, MD 21010-5401

Copies Furnished, continued:

Department of the Navy, ATTN: Code 18 (Ms. Armalia Berry), Washington Navy Yard, Bldg. 212, 901 "M" Street, S.E., Washington, DC 20374-5018

Director, U.S. Army Research Laboratory, 2800 Powder Mill Road, Adelphi, MD 20783-1197
ATTN: AMSRL-CS-AL-RK (Mr. Feustle/Mr. Brower/Mr. Craig)

APPENDIX D

THE NEED FOR SOCIOECONOMIC IMPACT ASSESSMENT

The assessment of socioeconomic impacts resulting from U.S. Army actions can be one of the more controversial issues related to the realignment or closure of an installation. The economic and social well-being of a local community can be dependent upon the activities of the installation and disruptions to the status quo become politically charged and emotion-laden. The objective of a socioeconomic analysis of U.S. Army actions is an open, realistic, and documented assessment of the potential effects.

The requirement to assess socioeconomic impacts in EAs or EISs has been a source of legal discussion since the passage of NEPA. While NEPA is predominantly oriented toward the biophysical environment, court decisions have supported the need for analysis of socioeconomic impacts when they are accompanied by biophysical impacts.

THE ECONOMIC IMPACT FORECAST SYSTEM (EIFS)

The U.S. Army developed the EIFS with the assistance of many academic and professional economists and regional scientists to address the economic impacts pursuant to NEPA and to measure their significance. The EIFS is designed for the scrutiny of a populace affected by the actions being studied.

The databases in EIFS are national in scope and cover approximately 3,700 counties, parishes, and independent cities recognized as reporting units by Federal agencies. EIFS allows the user to "define" an economic region of influence (ROI) by simply identifying the counties which are analyzed. Once the ROI is defined, the system aggregates the data, calculates "multipliers" and other variables used in the various models in EIFS, and prompts the user for input data.

THE EIFS IMPACT MODELS

The basis of the EIFS analytical capabilities is the calculation of multipliers which are used to estimate the impacts resulting from U.S. Army-related changes in local expenditures and/or employment. In calculating the multipliers, EIFS uses the economic base model approach which relies on the ratio of total economic activity to "basic" economic activity. Basic, in this context, is defined as the production or employment engaged to supply goods and services outside the ROI or by Federal activities (such as military installations and their employees). According to economic base theory, the ratio of total income to basic income is measurable (as the multiplier) and sufficiently stable so that future changes in economic activity can be forecast. This technique is especially appropriate for estimating "aggregate" impacts and makes the economic base model ideal for the EA/EIS process.

The multiplier is interpreted as the total impact on the economy of the region resulting from a unit change in its basic sector; for example, a dollar increase in local expenditures due to an expansion of a military installation. EIFS estimates its multipliers using a "location

quotient" approach based on the concentration of industries within the region relative to the industrial concentrations for the nation.

The user selects a model to be used from a menu of options. EIFS has a model for three basic military activity scenarios: standard, construction, and training. The user inputs those data elements into the selected model which describe the U.S. Army action: civilian and military to be moved and their salaries, the local procurement associated with the activity being relocated. Once these are entered into the system, a projection of changes in the local economy is provided. These are projected changes in sales volume, employment, income, and population. These four "indicator" variables are used to measure and evaluate socioeconomic impacts.

THE SIGNIFICANCE OF SOCIOECONOMIC IMPACTS

Once model projections are obtained, the Rational Threshold Value (RTV) and Forecast Significance of Impacts (FSI) profiles, allow the user to evaluate the "significance" of the impacts. These analytical tools review the historical trends for the defined region and develop measures of local historical fluctuations in sales volume, employment, income, and population. These evaluations identify the positive and negative changes within which a project can affect the local economy without creating a significant impact.

These techniques have two major strengths: (1) they are specific to the region under analysis and (2) they are based on actual historical time series data for the defined region. The use of the EIFS models in combination with the RTV and/or FSI have proven very successful in addressing perceived socioeconomic impacts. The EIFS models and these significance measuring techniques are theoretically sound and have been reviewed on numerous occasions.

CONSTRUCTION

Default price deflators:

baseline year (ex. business volume)	(CPI - 1982)	= 100.0
output and incomes (ex b.v.)	(CPI - 1991)	= 134.3
baseline year (construction)	(ENR-const - 1982)	= 100.0
local expenditures for construction	(ENR-const - 1991)	= 126.5
output and incomes (construction)	(ENR-const - 1991)	= 126.5

Dollar volume of construction project: 23000000
Local expenditures of project: 13,680,268.00 (calculated)
Percent for labor (enter new value or <cr> to accept default): (34.2)
Percent for materials (enter new value or <cr> to accept default): (57.8)
Percent allowed for other: 8.00 (calculated)
Percent of affected local construction workers expected to relocate
(enter <cr> to accept default): (0.0)

********** CONSTRUCTION IMPACT FORECAST FOR ALC BRAC EA **********

Export income multiplier:		2.4679	
Change in local			
Sales volume	Direct:	$11,669,000	
	Induced:	$17,128,000	
	Total:	$28,797,000	(0.115%)
Employment	Direct:	107	
	Total:	440	(0.071%)
Income	Direct:	$2,031,000	
	Total (place of work):	$9,979,000	
	Total (place of residence):	$9,979,000	(0.040%)
Local population		0	(0.000%)
Local off-base population		0	
Number of school children		0	
Demand for housing	Rental:	0	
	Owner occupied:	0	
Government expenditures.....		$509,000	
Government revenues		$743,000	
Net Government revenues		$233,000	
Civilian employees expected to relocate:		0	
Military employees expected to relocate:		0	

STANDARD EIFS FORECAST MODEL

```
Default price deflators:
   baseline year (ex. business volume) (CPI - 1982)       = 100.0
   output and incomes  (ex b.v.)       (CPI - 1991)       = 134.3
   baseline year (business volume)     (PPI - 1982)       = 100.0
   local services and supplies         (PPI - 1991)       = 116.5
   output and incomes (business volume)(PPI - 1991)       = 116.5

(Enter decreases as negative numbers)
If entering total expenditures, enter  1
           local expenditures, enter  2  : 1
Change in expenditures for services and supplies:  00
Change in expenditures for local services and supplies:  0.00 (calculated)
Change in civilian employment:  -104
Average income of affected civilian personnel:  38000
Percent expected to relocate (enter <cr> to accept default):  (0.0) 30
Change in military employment:  -3
Average income of affected military personnel:  30000
Percent of military living on-post:  00


********** STANDARD EIFS MODEL FORECAST FOR ALC  **********

Export income multiplier:                          2.4679
Change in local
  Sales volume ..............  Direct:       -$2,794,000
                              Induced:       -$4,102,000
                                Total:       -$6,896,000    (  -0.030%)
  Employment ................  Direct:               -28
                                Total:              -176    (  -0.028%)
  Income ....................  Direct:         -$528,000
                    Total (place of work):    -$5,345,000
               Total (place of residence):    -$5,345,000    (  -0.021%)
  Local population ..................:               -97    (  -0.008%)
  Local off-base population .........:               -97
  Number of school children .........:               -19
  Demand for housing .........  Rental:               -15
                          Owner occupied:               -19
  Government expenditures............:         -$313,000
  Government revenues ...............:         -$443,000
  Net Government revenues ...........:         -$131,000
Civilian employees expected to relocate:              -31
Military employees expected to relocate:               -3
```

STANDARD EIFS FORECAST MODEL

Default price deflators:

baseline year (ex. business volume)	(CPI - 1982)	= 100.0
output and incomes (ex b.v.)	(CPI - 1991)	= 134.3
baseline year (business volume)	(PPI - 1982)	= 100.0
local services and supplies	(PPI - 1991)	= 116.5
output and incomes (business volume)	(PPI - 1991)	= 116.5

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for seOrvices and supplies: 0
Change in expenditures for local services and supplies: 0.00 (calculated)
Change in civilian employment: -104
Average income of affected civilian personnel: 38000
Percent expected to relocate (enter <cr> to accept default): (0.0) 30
Change in military employment: -2
Average income of affected military personnel: 30000
Percent of military living on-post: 00

********** STANDARD EIFS MODEL FORECAST FOR ALC **********

Export income multiplier:		2.4679	
Change in local			
Sales volume	Direct:	-$2,782,000	
	Induced:	-$4,083,000	
	Total:	-$6,865,000	(-0.030%)
Employment	Direct:	-28	
	Total:	-175	(-0.028%)
Income	Direct:	-$526,000	
	Total (place of work):	-$5,309,000	
	Total (place of residence):	-$5,309,000	(-0.021%)
Local population		-95	(-0.007%)
Local off-base population		-95	
Number of school children		-18	
Demand for housing	Rental:	-14	
	Owner occupied:	-19	
Government expenditures.....		-$309,000	
Government revenues		-$439,000	
Net Government revenues		-$130,000	
Civilian employees expected to relocate:		-31	
Military employees expected to relocate:		-2	

STANDARD EIFS FORECAST MODEL

Default price deflators:

baseline year (ex. business volume)	(CPI - 1982)	= 100.0
output and incomes (ex b.v.)	(CPI - 1991)	= 134.3
baseline year (business volume)	(PPI - 1982)	= 100.0
local services and supplies	(PPI - 1991)	= 116.5
output and incomes (business volume)	(PPI - 1991)	= 116.5

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: 00
Change in expenditures for local services and supplies: 0.00 (calculated)
Change in civilian employment: -112
Average income of affected civilian personnel: 38000
Percent expected to relocate (enter <cr> to accept default): (0.0) 30
Change in military employment: -2
Average income of affected military personnel: 30000
Percent of military living on-post: 00

********** STANDARD EIFS MODEL FORECAST FOR **********

Export income multiplier: 2.4679

Change in local			
Sales volume	Direct:	-$2,994,000	
	Induced:	-$4,394,000	
	Total:	-$7,388,000	(-0.032%)
Employment	Direct:	-30	
	Total:	-188	(-0.030%)
Income	Direct:	-$566,000	
	Total (place of work):	-$5,712,000	
	Total (place of residence):	-$5,712,000	(-0.023%)
Local population		-102	(-0.008%)
Local off-base population		-102	
Number of school children		-19	
Demand for housing	Rental:	-15	
	Owner occupied:	-20	
Government expenditures.....		-$333,000	
Government revenues		-$473,000	
Net Government revenues		-$140,000	
Civilian employees expected to relocate:		-34	
Military employees expected to relocate:		-2	

********** STANDARD EIFS MODEL FORECAST FOR 4 **********

Export income multiplier:		2.4679	
Change in local			
Sales volume	Direct:	$7,493,000	
	Induced:	$10,999,000	
	Total:	$18,492,000	(0.080%)
Employment	Direct:	75	
	Total:	475	(0.076%)
Income	Direct:	$1,416,000	
	Total (place of work):	$14,402,000	
	Total (place of residence):	$14,402,000	(0.057%)
Local population .....:		273	(0.022%)
Local off-base population .....:		273	
Number of school children .....:		53	
Demand for housing	Rental:	43	
	Owner occupied:	54	
Government expenditures.....:		$849,000	
Government revenues .....:		$1,200,000	
Net Government revenues .....:		$350,000	
Civilian employees expected to relocate:		83	
Military employees expected to relocate:		14	

... type RETURN to continue ...

Type:	To:
f	print your input values and output to a file
i	see your input values
o	see your output again
m	return to Forecast Models menu
q	return to EIFS

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APPENDIX E

AMENDED PROGRAMMATIC AGREEMENT

AMENDED
PROGRAMMATIC AGREEMENT
BETWEEN
DEPARTMENT OF THE ARMY
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND
THE NATIONAL CONFERENCE OF STATE HISTORIC PRESERVATION OFFICERS
CONCERNING
REALIGNMENT AND CLOSURE OF ARMY INSTALLATIONS
IN ACCORDANCE WITH
BASE CLOSURE AND REALIGNMENT ACT

WHEREAS, the Department of the Army (Army) is responsible for implementation of applicable portions of the Base Closure and Realignment Act of 1988 (P.L. 100-526) and the Defense Base Closure and Realignment Act of 1990 (P.L. 101-510), commonly known as the "BRAC" program; and

WHEREAS, the Army is proceeding with base realignment and closure actions, to include the realignment of functions and units, closure of installations, and disposal of surplus property in a manner consistent with the "Report of the Defense Secretary's Commission on Base Realignments and Closures," December 29, 1988 (Commission Report) and "Defense Base Closure and Realignment Commission Report to the President 1991," July 1, 1991; and

WHEREAS, the Army has determined that its implementation of the BRAC program may have effects on properties included in and eligible for inclusion in the National Register of Historic Places (historic properties); and

WHEREAS, the Army has entered into a Programmatic Agreement on February 5, 1990 with the Advisory Council on Historic Preservation (Council) and the National Conference of State Historic Preservation Officers (NCSHPO) pursuant to Section 800.13 of the regulations (36 CFR Part 800) implementing Sections 106 and 110(f) of the National Historic Preservation Act (NHPA) and Army Regulation 420-40, "Historic Preservation;" and

WHEREAS, the Army has renewed its consultation with the Council and the NCSHPO to amend the previous Agreement because of new realignment and closure actions not covered by the previous Agreement;

NOW, THEREFORE, the Army, the Council, and the NCSHPO agree that the Army's implementation of the BRAC program shall be administered in accordance with the following stipulations, which will supersede the Agreement of February 5, 1990, and will satisfy the Army's Section 106 and 110(f) responsibilities for all individual undertakings under the BRAC program.

Stipulations

The Army will ensure that the following measures are carried out.

I. Applicability

The terms of this Agreement apply only to Army installations which may be affected under the provisions of P.L. 100-526 and P.L. 101-510 (see Attachment 1).

II. Areas of Potential Effects

Although some BRAC actions may induce changes in population distribution, traffic, and land use that extend beyond the particular facilities to be closed and parcels on which new construction will occur, the effect of these changes on historic properties is uncertain at this time. Accordingly, during preliminary coordination with the SHPO (Stipulation III), the Army will define the area of potential effects of a BRAC action consistent with the Council's regulations (36 CFR Section 800.2(c), 800.9(a), and 800.9(b)) and with reference to possible adverse effects to known historic properties which may reasonably be expected to occur on or adjacent to the property subject to the BRAC action. In cases of dispute over the area of potential effects of a BRAC action, the opinion of the Council will be binding on all parties to this Agreement.

III. NEPA and Preliminary Coordination with the SHPO

A. It is mutually understood that many of the terms of this Agreement will be carried out after the Army has complied with the National Environmental Policy Act (NEPA) and filed its Record of Decision (ROD), Finding of No Significant Impact (FNSI), or Record of Environmental Consideration (REC). Nevertheless:

1. the Army must meet all its NHPA responsibilities for BRAC generated activities; and

2. whenever it is feasible for the Army to carry out the terms of this Agreement prior to filing the ROD, FNSI, or REC, the Army will do so; and

3. when it is infeasible to complete the actions required by Sections 106 and 110(f) of the NHPA prior to issuance of a REC, FNSI (assuming a FNSI is otherwise proper given the affects on historic properties) or ROD, the Army will stipulate in the REC, FNSI or ROD the specific areas in which the Army has not complied with the NHPA. The FNSI or ROD will further specify that the Army will not undertake any new BRAC construction, renovation, land disposal, training exercises, or other activities which could

affect historic properties until the actions necessary to inventory, assess, and take into account the effects on historic properties have been completed consistent with the terms set forth in this Agreement; and

4. the Army Historic Preservation Officer or her designee will review the draft ROD or FNSI for each BRAC project to ensure that outstanding historic preservation requirements are adequately addressed in these documents; and

5. the Army will ensure that no actions that could result in effects on historic properties are undertaken pursuant to a ROD, FNSI, or REC until the terms of this Agreement have been carried out.

B. The Army will notify the appropriate SHPO within 60 days after the signing of this agreement about the nature and timing of the BRAC actions for individual installations and will provide the following information:

1. a description of the type and location of the undertaking.

2. currently available milestones for BRAC actions affecting the installation.

3. information available about historic properties at the installation.

4. currently available information about the actions of the Department of Defense Office of Economic Adjustment concerning the setup of local reuse committees for those installations or portions of installations which the Army will dispose.

C. The Army will coordinate the NEPA process with its NHPA activities. In accordance with the memorandum to all BRAC participants (Attachment 2), NEPA documentation for each facility will:

1. identify known historic properties and past studies;

2. identify the potential for historic properties to be affected by the BRAC process; and

3. identify the steps necessary for the Army to meet its Section 106 responsibilities under NHPA.

D. The level of documentation in Stipulation III. C. 1-3. above will be commensurate with the type of environmental document prepared. Only brief overviews and summaries of impacts, if any, are expected in Records of Environmental Consideration and Environmental Planning Guides. When Environmental Assessments and Environmental Impact Statements are prepared, a more detailed presentation of data will be included.

E. The Army will send the Council and appropriate SHPOs all BRAC Environmental Assessments (EAs) and Draft Environmental Impact Statements (DEISs) for their review and comment. There will be a 45 day review period for each EIS during the public comment period. The review time for each EA, however, will be 15 working days from receipt, due to an accelerated schedule. The information included in these documents will constitute the first effort in the process to identify historic properties and assess the potential effects on them as defined in 36 CFR Part 800.4 and 800.5.

F. The Army will ensure that copies of final BRAC EAs and Final Environmental Impact Statements (FEISs) are provided to appropriate SHPOs and the Council.

G. The Army shall provide a copy of this Agreement, its attachments, AR 420-40, 36 CFR 800, and the materials listed in Stipulation IX of this Agreement to appropriate commanders and Army elements responsible for Army BRAC NEPA compliance.

H. On November 1, 1992 and on that same date every year thereafter, the Army will provide the Council, all appropriate SHPOs, and the NCSHPO, with an annual update report on the status of BRAC activities. The report shall discuss all BRAC historic resource investigations and coordination undertaken and document all no effect or no adverse effect determinations received for BRAC projects. The report will also include a discussion of activities undertaken for closing facilities by the Department of Defense Office of Economic Adjustment. This report will be prepared until such time as all necessary NHPA requirements for BRAC have been met or a decision has been made by the Army not to proceed with further BRAC actions.

IV. IDENTIFICATION AND EVALUATION

A. Identification

1. Based on the assembly of existing information through the NEPA process, the Army will consult with appropriate SHPOs and make a reasonable and good faith effort to identify historic properties located on installations under Army control that will be affected by BRAC construction, U.S. Army Corps of Engineers

Toxic and Hazardous Materials Agency (THAMA) BRAC cleanup activities, or U.S. Army BRAC land disposal activities.

2. When existing information is not adequate for identifying historic properties that will be affected by BRAC activities, the Army will undertake installation-specific field surveys in accordance with appropriate professional standards as defined in the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716-42; hereafter "Standards and Guidelines"), except as provided in Attachment 3.

3. The Army will develop priorities for undertaking identification and evaluation of historic properties on individual installations. These priorities will be determined by:

a. the specific nature and timing of the undertaking proposed;

b. the land configuration, size, current mission, and land use history of the individual Army installation;

c. the potential nature and extent of historic properties (including but not limited to those which may be of special significance for their connection with the origins and the development of the Cold War); and

d. possible constraints on field investigations, such as ranges, impact and contaminated areas, safety zones and hazardous materials.

4. All identification and evaluation actions will be carried out by the Army in consultation with the appropriate SHPO. The Army will provide information to the SHPOs concerning the constraints of the type noted in Stipulation IV.A.3.d. above. In addition, the Army and the SHPOs will assemble and exchange information as it becomes available on the location and evaluation of historic properties.

5. The Army will ensure the identification of records and objects related to the historic significance of properties to be disposed of. Each installation will be required to identify extant historic records and related historic objects.

6. Throughout the planning and implementation of the BRAC program, the Army will provide guidance to the field to ensure that historic properties are not inadvertently damaged, destroyed, or allowed to deteriorate before, during, or after closure or realignment.

B. Evaluation

The Army will determine, in consultation with the appropriate SHPO, the eligibility of properties for inclusion in the National Register in accordance with 36 CFR 800.4(c), and with reference to inventories and planning by the State, the Army's history and traditions, previous Army historic site surveys, and any thematic studies that may have been completed or are underway. If the Army and SHPO fail to agree upon the National Register eligibility of a property, the Army will obtain a determination of eligibility from the Secretary of Interior pursuant to 36 CFR 800.4 (c)(4).

V. Determinations of Effect

A. The Army, in consultation with the appropriate SHPO, shall determine the effect of BRAC actions on historic properties in accordance with 36 CFR 800.5, applying the Criteria of Effect and Adverse Effect at 36 CFR 800.9.

B. Where the Army determines pursuant to 36 CFR 800.5 that an adverse effect may occur, then:

1. if the Army determines, in consultation with the SHPO and taking into account the comments, if any, of the interested persons identified at 36 CFR 800.5(e)(1), that it is appropriate to apply the standard mitigation measures set forth in Attachment 4, the Army will provide the SHPO and the Council with sufficient documentation to support this determination, advise them that the Army intends to carry out the specified measures, and request their concurrence within 30 days. If the Council and the SHPO concur within 30 days of their receipt of such documentation, the Army shall carry out the standard mitigation measures it has determined to be appropriate. Failure by the Council or SHPO to respond within the specified time period shall be conclusive of that party's concurrence. Should the Council or SHPO disagree with the Army's determination, the Army will initiate consultation in accordance with 36 CFR 800.5(e).

2. if the Army and the SHPO, taking into account the comments, if any, of the interested persons identified at 36 CFR 800.5(e)(1), agree on a program to avoid, minimize, or mitigate the adverse effect, the Army will provide the Council with sufficient documentation to support this determination and request its concurrence within 30 days. If the Council concurs within 30 days of its receipt of such documentation, the Army shall carry out the program. Failure by the Council to respond within the specified time period shall be conclusive of the Council's concurrence. Should the Council object to the program, the Army will undertake

consultation in accordance with 36 CFR 800.5(e).

3. if the Army determines that neither paragraph 1 nor paragraph 2 above is applicable, or effects on an NHL are involved, then the Army will initiate consultation in accordance with 36 CFR 800.5(e).

VI. Treatment and Management.

A. The Army will ensure that the effects of BRAC actions on historic properties are treated in accordance with the determinations and agreements reached pursuant to Stipulation V.

B. For those installations or portions of installations which will remain under Army control, the Army will develop treatment and management plans to ensure that properties affected by BRAC are incorporated into installation Historic Preservation Plans/Cultural Resource Management Plans (HPP/CRMP) in accordance with AR 420-40, and shall create such HPP/CRMPs should they not presently exist. All such HPP/CRMPs shall be developed or amended to include properties affected by BRAC within a reasonable period of time following the date of this Agreement, not to exceed the September 30, 1995 date for completion of BRAC actions as specified in P.L. 100-526 and the July 1, 1998 date as specified in P.L. 101-510.

C. Notwithstanding any other provision of this Agreement, the Army may undertake documentation of historic structures in a manner consistent with the Secretary of the Interior's Standards and Guidelines for Architectural and Engineering Documentation (48 FR 44730-34) prior to making a determination or reaching an agreement pursuant to Stipulation V, if the Army judges that such documentation is likely to be part of an acceptable mitigation program.

D. Notwithstanding any other provision of this Agreement, the Army may enter into agreements with appropriate SHPOs and the Council, seeking the concurrence of other interested persons, if any, establishing processes for the identification, evaluation, treatment and management of historic properties that may be subject to effect by a BRAC action, in lieu of identifying such properties and establishing specific treatment or management plans for them prior to making a decision regarding such an action, where:

1. the precise nature, schedule, location or design of the action is uncertain, and

2. the Army, SHPO, and Council agree that the effects of the action are likely to be relatively minor, or affect historic

properties whose treatment or management will require the application of routine procedures.

E. The Army will ensure that the provisions of the Archaeological Resources Protection Act (P.L. 96-95) and the Native American Graves Protection and Repatriation Act (P.L. 101-601) are implemented, as appropriate, during the BRAC program.

VII. Interim Protection, Records Retention, and Long-Term Curation

A. The Army will notify the appropriate commanders of the need for interim protection of identified and potential historic properties to ensure that deferred maintenance or other management decisions do not adversely affect the integrity of these properties. Important architectural elements will be identified to ensure future appropriate disposal.

B. The Army will consult with the SHPO on terms of curation and disposition of historical documents, drawings, photographs, reports, and archeological materials generated by BRAC studies.

VIII. Public Involvement

A. For those installations or portions of installations of which the Army will dispose, the Army will notify the Department of Defense Office of Economic Adjustment and the local reuse committees about NHPA requirements and concerns. To the fullest extent possible and appropriate, the Army will work with the local reuse committees, appropriate SHPOs and other interested parties to develop treatments and/or management plans to ensure compatible reuse.

B. The Army and the appropriate SHPO will consider the need for additional consulting parties consistent with the Council's publication, "Public Participation in Section 106 Review: A Guide for Agency Officials" (Advisory Council on Historic Preservation, 1989).

C. To the extent practicable, public participation shall be coordinated with public participation under NEPA.

IX. Standards and Guidelines

Standards and guidelines for implementing this Agreement include, but are not limited to:

Army Regulation (AR) 420-40: Historic Preservation

(Department of the Army, 15 May 1984);

36 CFR Part 800: Protection of Historic Properties;

The Section 110 Guidelines: Guidelines for Federal Agency Responsibilities under Sec. 110 of the National Historic Preservation Act (53 FR 4727-4746);

The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716-42);

The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (National Park Service, 1990);

Identification of Historic Properties: a Decisionmaking Guide for Managers (Advisory Council on Historic Preservation, 1988);

Public Participation in Section 106 Review: A Guide for Agency Officials (Advisory Council on Historic Preservation, 1989); and

Preparing Agreement Documents (Advisory Council on Historic Preservation, 1989).

Guidelines for Evaluating and Documenting Traditional Cultural Properties (National Register Bulletin 38, 1991).

X. Dispute Resolution

A. Should a SHPO or an interested person identified at 36 CFR 800.5(e)(1) object to the Army's implementation of any part of this Agreement, the Army shall consult with the objecting party to resolve the objection. If the Army determines that the objection cannot be resolved, the Army shall forward all documentation relevant to the dispute to the Council. Within 30 days after receipt of all pertinent documentation, the Council will either:

1. provide the Army with recommendations, which the Army will take into account in reaching a final decision regarding the dispute; or

2. notify the Army that it will comment pursuant to 36 CFR 800.6(b), and proceed to comment. Any Council comment provided in response to such a request will be taken into account by the

Army in accordance with 36 CFR 800.6(c)(2) with reference to the subject of the dispute.

B. Any recommendation or comment provided by the Council will be understood to pertain only to the subject of the dispute; the Army's responsibility to carry out all actions under this Agreement that are not the subject of the dispute will remain unchanged.

C. Should a member of the public object to any measure carried out under the terms of this Agreement, or the manner in which such a measure is implemented, the Army shall take the objection into account and consult as needed with the objecting party, the SHPO, and the Council to resolve the objection.

XI. Amendments

Any party to this Agreement who determines that some portion of the Agreement cannot be met must immediately request the other signatories to consider an amendment or addendum to this Agreement which would ensure full compliance. Such an amendment or addendum shall be executed in the same manner as the original Agreement. Should any party to this Agreement be unable to maintain a level of effort sufficient to carry out the terms of this Agreement, that party shall notify the others and seek an appropriate amendment.

XII. Termination of Existing and New Agreements

A. The Agreement of February 5, 1990 for the BRAC program will terminate upon the date of final signature of this Agreement.

B. This Agreement will terminate on September 30, 1997, unless the parties agree to extend the terms of this agreement beyond that date.

Execution and implementation of this Programmatic Agreement establishes that the Army has satisfied its responsibilities under Sections 106 and 110(f) of the National Historic Preservation Act for all individual undertakings of the BRAC program as outlined in this Agreement.

DEPARTMENT OF THE ARMY

BY: _____ (date) 13 July 92
Paul W. Johnson, Deputy Assistant Secretary of the Army
(Installations and Housing)

NATIONAL CONFERENCE OF STATE HISTORIC PRESERVATION OFFICERS

BY: _____ (date) 7/17/92
H. Bryan Mitchell, President

ADVISORY COUNCIL ON HISTORIC PRESERVATION

BY: _____ (date) 7/15/92
John C. Harper, Chairman

ATTACHMENT 1

BRAC I AFFECTED FACILITIES

Alabama

Alabama Army Ammunition Plant - closure
Coosa River Annex - closure
Anniston Depot - realignment
Redstone Arsenal - realignment

Arizona

Navajo Activity - closure
Fort Huachuca - realignment
Yuma Proving Ground - realignment

California

Presidio of San Francisco - closure
Hamilton Army Air Field - closure
Sierra Depot - potential realignment
Fort Ord - realignment*
Oakland Army Base - realignment
Fort Irwin - realignment
Camp Parks - realignment
Sacremento Army Deport - realignment*

Colorado

Bennett Army National Guard Facility - closure
Pueblo Depot - realignment
Fort Carson - realignment
Fitzsimmons Army Medical Center - realignment

District of Columbia

Fort McNair - realignment
Walter Reed Army Medical Center - realignment

Florida

Cape St. George Reservation - closure

Georgia

Fort Gordon - realignment
Fort Benning - realignment

Hawaii

Kapalama Military Reservation - closure
Schofield Barracks - realignment

Illinois

Fort Sheridan - closure

Indiana

Jefferson Proving Ground - closure
Indiana Army Ammunition Plant - partial closure
Fort Benjamin Harrison - realignment*

Iowa

Fort Des Moines - partial closure

Kansas

Fort Leavenworth - realignment

Kentucky

Lexington Bluegrass Army Depot - closure
Bluegrass Activity - realignment
Fort Knox - realignment
Fort Campbell - realignment

Louisiana

New Orleans Military Ocean Terminal - closure

Massachusetts

Army Materials Technology Laboratory - closure
Fort Devens - realignment*
Natick Research, Development & Engineering Center - realignment

Maryland

Nike site at Aberdeen Proving Ground - closure
Gaithersburg Army Reserve Center - closure
Fort Meade - partial closure and realignment
Fort Holabird - partial closure and realignment
Fort Detrick - realignment+
Aberdeen Proving Ground - realignment
Harry Diamond Laboratory - realignment

Michigan

Pontiac Storage Facility - closure
Detroit Arsenal - realignment+

Missouri

Nike site at Kansas City - closure
Fort Leonard Wood - realignment

North Carolina

Fort Bragg - realignment

New Jersey

Fort Dix - realignment
Fort Monmouth - realignment+
Picatinny Arsenal - realignment+
Nike Philadelphia 41/43 (stand alone housing) - closure

New Mexico

Fort Wingate - closure
White Sands Missile Range - realignment

Nevada

Hawthorne Army Ammunition Plant - realignment

New York

Fort Drum - realignment

Okalahoma

Fort Sill - realignment

Oregon

Umatilla Depot - realignment

Pennsylvania

Tacony Warehouse - closure
Tobyhanna Depot - realignment
Letterkenny Depot - realignment
Fort Indiantown Gap - realignment

South Carolina

Fort Jackson - realignment

Texas

Fort Bliss - realignment
Red River Depot - realignment

Utah

Fort Douglas - closure
Tooele Depot - realignment

Virginia

Cameron Station - closure
Fort Belvoir - realignment
Fort Lee - realignment
Fort Myer - realignment
Fort A. P. Hill - realignment

Washington

Fort Lewis - realignment

Wisconsin

Fort McCoy - realignment

The Defense Base Closure and Realignment Act of 1990, Public Law 101-510, (BRAC 91) overturned a number of the base realignment and closure recommendations made by the Base Closure and Realignment Act of 1988, Public Law 100-526, (BRAC I).

* Indicates that the installation is now recommended for closure by BRAC 91.

+ Indicates that the realignment actions proposed by BRAC I have been overturned by BRAC 91 recommendations.

BRAC 91 AFFECTED FACILITIES

Alabama

- Anniston Army Depot - realignment
- Redstone Arsenal - realignment

Arizona

- Fort Huachuca - realignment

Arkansas

- Fort Chaffee - realignment

California

- Fort Ord - closure
- Sacramento Army Depot - closure

Colorado

- Fort Carson - realignment

Illinois

- Rock Island Arsenal - realignment

Indiana

- Fort Benjamin Harrison - closure

Kentucky

- Fort Knox - realignment

Louisiana

- Fort Polk - realignment

Maryland

- Aberdeen Proving Ground - realignment
- Harry Diamond Laboratories, Adelphi - realignment

Massachusetts

- Fort Devens - closure

Missouri

Aviation Systems Command & Troop Support Command - realignment

New Jersey

Fort Dix - realignment
Fort Monmouth - realignment
Picatinny Arsenal - realignment

New Mexico

White Sands Missile Range - realignment

Ohio

Army Aviation Propulsion Directorate - realignment

Pennsylvania

Letterkenny Army Depot - realignment
Tobyhanna Army Depot - realignment

South Carolina

Fort Jackson - realignment

Texas

Corpus Christi Army Depot - realignment
Fort Hood - realignment
Red River Army Depot - realignment

Virginia

Army Research Institute - realignment
Fort Belvoir - realignment
Harry Diamond Laboratory, Woodbridge Research Facility - closure

Washington

Fort Lewis - realignment

ATTACHMENT 2

PLAN TO ACCOMPLISH HISTORIC AND CULTURAL RESOURCES REQUIREMENTS IAW BASE REALIGNMENT AND CLOSURE IMPLEMENTATION PLAN FOR THE ARMY

1. Purpose. The Army will accomplish the requirements of this Programmatic Agreement IAW the BRAC Implementation Plan and the following guidance.

2. Chief of Engineers (COE) will:

a. Provide technical advice and assistance relating to compliance with historic and cultural resources laws, rules, and regulations.

b. Develop standards for information about historic and cultural resources and for assessments of undertakings having an effect on significant and historic resources.

c. Assist MACOMs in developing MOAs and compliance documents for individual installations.

d. Obtain the signature of the Army's Federal Representative (OASA(I&H)) on Memorandum of Agreement (MOA) entered into with the Advisory Council and the SHPOs for installation base realignment and closure undertakings.

e. Review historic and cultural resources work requirements and cost estimates, as requested by MACOMs.

f. Monitor compliance activities in order to correlate with BRAC schedule and report to Deputy Assistanct Secretary of the Army (Installations and Housing).

g. Prepare an annual update report on BRAC cultural resource activities for distribution to appropriate Army offices, SHPOs and the Advisory Council. This report will be based upon information to be supplied by appropriate MACOMs.

h. Notify appropriate SHPOs about the nature and timing of BRAC actions on Army installations within their states. The content of these notifications will be based upon information supplied by affected MACOMs.

i. Coordinate with and inform the Office of Economic Adjustment and designated reuse committees about historic property concerns at closing Army facilities.

j. Point of contact is Constance Ramirez (CEHSC-FN) CML 703-704-1570, DNS 654-1570.

k. USACE Mobile District will assist CEHSC-FN with the management and coordination of the BRAC cultural resources program.

3. MACOMs will:

a. Ensure that all installations meet NHPA requirements.

b. Include compliance with NHPA in MACOM Base Realignment and Closure Implementation Plan and engineer action plan.

c. Consolidate, evaluate, and program installation historic and cultural resources work and funding requirements based upon Corps of Engineers input.

d. Identify compliance tasks and schedule for each installation.

e. Assist installations, as appropriate, in development of MOAs and other compliance and mitigation documents.

f. Forward all MOAs to CEHSC-FN for ratification by Army's Federal Representative (DASA(I&H)).

g. Review DD Form 1391 to ensure project compliance with NHPA and/or MOAs.

h. Coordinate with Center for Military History on treatment of historic records associated with historic places.

i. Provide CEHSC-FN with annual updates of BRAC cultural resource accomplishments so that an annual report can be prepared for submission to appropriate Army offices, SHPOs, and the Advisory Council.

j. Provide CEHSC-FN with information about the nature and timing of BRAC actions at individual installations so that this information can be communicated to appropriate SHPOs.

k. MACOM historic preservation contacts are:

FORSCOM: Dr. James Cobb/FCEN-CED-E/(404)669-7812

TRADOC: Dr. Paul Green/ATBO-GE/(804)727-2037

AMC: Mr. Paul McGuff/CESWF-PL-RC/USACE Fort Worth District/(817)334-2625

MDW: Ms. Edna Barber/ANEN-E/(202)475-2793

Other MACOMs: Dr. Constance Ramirez/CEHSC-FN/(703)704-1570

l. MACOMs will ensure that installations:

(1). Provide all existing information about historic and cultural resources to USACE districts preparing Section 106

Consultation Packages and Environmental Assessment/Environmental Impact Statements.

(2). Ensure adequacy of historic and cultural resource information in NHPA and NEPA documentation.

(3). Establish a POC for historic resources for all base realignment and closure actions and forward name, address and telephone number to MACOM POC.

(4). Provide materials about the installation's mission and its historic and cultural resources for compliance consultation with SHPO, Advisory Council and MACOM.

4. MACOMs will provide guidance to USACE District Offices and contractors preparing or overseeing preparation of NEPA documents to:

a. Ensure that adequate information on historic and cultural resources are included in each REC, EA, and EIS.

b. Include the following information in each EA and EIS regarding historic and cultural resources:

(1) Reference and description of BRAC Programmatic Agreement.

(2) Background statements on the prehistory, civilian history, and military history of the affected installation.

(3) Overview of previous cultural resource inventories, investigations, agreements, and historic preservation plans.

(4) List and give general locations of all National Historic Landmarks or National Register properties and districts located on the subject installation. When feasible and not considered detrimental to site protection and preservation, the locations of these properties should be displayed on maps.

(5) If applicable, list and give locations of National Historic Landmarks or National Register properties located off of Army property that might be affected physically, visually, or audibly by BRAC activities. When feasible and not considered detrimental to site protection and preservation, the locations of these properties should be displayed on maps.

(6) Give the number and general location of archeological sites and historic buildings on the subject facility. State how many of these properties have been determined eligible for the National Register. When feasible and not considered detrimental to site protection or preservation the locations these properties should be displayed on maps.

(7) State whether the buildings or lands to be affected by BRAC actions have been inventoried for National Register significance. Identify any historic buildings and/or archeological sites that will be affected by BRAC actions. Give the National Register status of these properties. If the areas to be affected have been previously examined and a no effect or no adverse effect will result from the BRAC activities, reference the SHPO correspondence that concurs with this opinion.

(8) If National Register eligible or listed properties are located within the area of potential effect, determine the effects of the BRAC action on these historic properties. Effects may include but not be limited to:

(a) Destruction of historic buildings.
(b) Construction in historic districts.
(c) Repair or alteration of historic buildings.
(d) Construction in areas with archeological sites.
(e) Transfer of ownership to non-federal parties.
(f) Decreased maintenance resulting in deterioration of historic buildings.
(g) Change of mission training in range areas resulting in soil erosion or disturbance of ground surface in new areas.

(9) Describe and state the results of any cultural resource investigations undertaken for BRAC actions.

(10) Identify any additional cultural resource investigations that will be required to meet NEPA and NHPA Section 106, 110, and 111 requirements before the BRAC action can proceed. The scope of these actions should be identified in as much detail as possible. Recommendations for work should be restricted solely to those effects brought about by BRAC closure, realignment, or land disposal actions. Information about work efforts to be recommended at the affected installations will include at least the following:

(a) Approximate size (in acres) of areas to be recommended for archeological survey.

(b) Approximate number and locations of buildings, structures, districts, objects or sites to be recommended for historical inventory.

(c) Approximate number of known archeological sites needing additional investigations to determine National Register eligibility.

(d) Approximate cost estimates to complete the above recommended work items.

(11) Provide POC for historic resources actions to MACOMs.

5. Schedule: In order to ensure that NHPA requirements do not delay realignments and closure activities, work should be initiated and funded at the earliest possible date to accomplish necessary resource inventories, studies, mitigation, and coordination measures.

6. Point of Contact for techical questions is CEHSC-FN (Constance Ramirez) at CML 703-704-1570/DNS 654-1570. Point of contact for questions concerning policy issues is DAEN-ZCI-B (Doug Macherey) at CML 703/693-5039/AV 223-5039.

ATTACHMENT 3

EXCEPTIONS TO IDENTIFICATION PROCEDURES

Where existing information is not adequate for identifying historic properties, the Army nonetheless need not undertake installation-specific field surveys pursuant to Stipulation IV.A.2 if:

a. the lands involved will be transferred to another Federal agency that will use them for purposes no more likely to adversely affect historic properties than those for which the lands are presently used by the Army, provided the recipient Federal agency agrees to develop and implement a program, in consultation with the SHPO and other interested persons, for carrying out the requirements of Section 110(a)(2) of the National Historic Preservation Act on the lands it receives; or

b. the lands involved will be transferred to a State or local agency that enters into an agreement with the Army, the SHPO, and the Council stipulating that it will use them for purposes likely to have no adverse effect on historic properties which may be present, and that it will develop and implement a program, in consultation with the SHPO, the Council, and other interested persons, for identifying and protecting historic properties in a manner consistent with the "Standards and Guidelines" and other applicable Department of the Interior and Council guidelines: or

c. the BRAC action that will affect the lands involved, and the nature of the historic properties that may exist on such lands, are such that the Army, the SHPO, the Council, and other interested persons agree that identification need not be carried out, or may be carried out at a later date, and enter into an agreement stipulating how and by whom any identification will be carried out.

ATTACHMENT 4

STANDARD MITIGATION MEASURES

1. Transfer of a historic building or structure subject to a preservation covenant, enforceable under applicable State law, equivalent to the example shown in Figure 7 of the Council's 1989 publication: "Preparing Agreement Documents" (pp. 30-31), combined with a program of recordation approved by the SHPO as consistent with the Secretary of the Interior's Standards and Guidelines for Architectural and Engineering Documentation (48 FR 44730-34).

2. Recovery of data from an archeological site or sites in accordance with a research design and data recovery plan prepared in consultation with the SHPO and interested persons (including any interested Indian tribe or other Native American group) and addressing each of the following points:

- the property, properties, or portions of properties where data recovery is to be carried out;

- any property, properties, or portions of properties that will be altered or transferred without data recovery;

- the research questions to be addressed through the data recovery, and the importance and relevance of each;

- the methods to be used, and their relevance to the research questions;

- the methods to be used in analysis, data management, and dissemination of data, including a schedule;

- the disposition of recovered materials and records;

- the methods for involving the interested public in the data recovery;

- the methods for disseminating results of the work to the interested public;

- the methods by which local governments, Indian tribes, and other interested persons will be kept informed of the work and afforded the opportunity to comment; and

- the methods and schedule by which progress and final reports will be provided to the SHPO, the Council, and interested persons.

LIST OF ACRONYMS

AAQS	Ambient Air Quality Standards
ACHP	Advisory Council on Historic Preservation
ADT	Average Daily Traffic
ALC	Adelphi Laboratory Center
AMC	Army Materiel Command
APG	Aberdeen Proving Ground
AR	Army Regulation
ARL	Army Research Laboratory
ASL	Atmospheric Sciences Laboratory
BMPs	Best Management Practices
B.P.	Before Present
BRAC	Base Realignment and Closure
BRAC 91	BRAC Act of 1991
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
CCCF	Central Chemical Control Facility
CE	U.S. Army Corps of Engineers
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERL	U.S. Army Construction Engineering Research Laboratory
CO	Carbon Monoxide
COMAR	Code of Maryland Regulations
DA	Department of the Army
dBA	decibels, A-weighted scale
DNR	Department of Natural Resources
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EDTL	Electronics Technology and Devices Laboratory
EIFS	Economic Impact Forecast System
EIS	Environmental Impact Statement
EMP	Electromagnetic Pulsed Radiation
EPA	U.S. Environmental Protection Agency
EPSD	Electronics and Power Sources Directorate
ESC-SWM	Erosion Sediment Control - Storm Water Management
ETDL	Electronics Technology Devices Laboratory
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FNSI	Finding of No Significant Impact
FWS	U.S. Fish and Wildlife Service
FY	Fiscal Year
H/C	Heating/Cooling
HDL	Harry Diamond Laboratories
HQ	Headquarters
HTHW	High Temperature Hot Water
HTW	High Temperature Water
HVAC	Heating, Ventilating, and Air Conditioning
ISCP	Installation Spill Contingency Plan
LABCOM	U.S. Army Laboratory Command
L_{eq}	Equivalent Sound Levels
LOS	Level of Service
LP	Liquid Propane
M-NCPPC	Maryland-National Capital Park and Planning Commission
MARC	Maryland Rail Commuter Service

MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
MSC	Major Subordinate Command
MSDS	Material Safety Data Sheet
msl	mean sea level
NCPC	National Capital Planning Commission
NEPA	National Environmental Policy Act of 1969
NHP	Maryland Natural Heritage Program
NHPA	National Historic Preservation Act of 1966 (as amended)
NOI	Notice of Intent
NO_x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPS	Non-Point Source
NRC	Nuclear Regulatory Commission
NRTC	Naval Reserve Training Center
NSWC	U.S. Naval Surface Warfare Center
NVEOD	Night Vision Electro-Optics Directorate
O-S	Open Space
PA	Programmatic Agreement
PC	Printed Circuit
PCB	Polychlorinated Biphenyl
PEPCO	Potomac Electric Power Company
R-R	Rural Residential (Zone)
R&T	Research and Technology
RCRA	Resource Conservation and Recovery Act
RE-2	Single Family Residential (Zone)
ROD	Record of Decision
ROI	Region of Influence
RTV	Rational Threshold Value
SARA	Superfund Amendments and Reauthorization Act
SCIF	Sensitive Compartmented Information Facility
SEMTF	Semi-conductor Electronic Materials Technology Facility
SF	Square Feet
SHPO	State Historic Preservation Officer
SO_2	Sulfur Dioxide
SPCC	Spill Prevention, Control, and Countermeasure
TEMPO	Transverse Electromagnetic Pulse Operation
TSCA	Toxic Substance Control Act
UST	Underground Storage Tank
VAL	Vulnerability Assessment Laboratory
VOCs	Volatile Organic Compounds
WMATA	Washington Metropolitan Area Transit Authority
WRAMC	Walter Reed Army Medical Center
WSMR	White Sands Missile Range
WSSC	Washington Suburban Sanitary Commission